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IN THE

Supreme Court of the United States

OCTOBER TERM, 1973

No. 1529

THE GENERAL TIRE & RUBBER COMPANY,
Petitioner,

vs.

THE FIRESTONE TIRE & RUBBER COMPANY,
Respondent.

PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SIXTH CIRCUIT.

CHARLES J. MERRIAM,
EDWARD M. O'TOOLE,
Two First National Plaza,
Chicago, Illinois 60670,
Counsel for Petitioner.

MERRIAM, MARSHALL, SHAPIRO & KLOSE,
Two First National Plaza,
Chicago, Illinois 60670,

TRESS E. PITTENGER,
FRANK C. ROTE,
One General Street,
Akron, Ohio 44309,
Of Counsel.

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No. 1529

THE GENERAL TIRE & RUBBER COMPANY,
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vs.

THE FIRESTONE TIRE & RUBBER COMPANY,
Respondent.

PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SIXTH CIRCUIT.

Petitioner, The General Tire & Rubber Company, prays that a writ of certiorari issue to review those portions of the judgment of the United States Court of Appeals for the Sixth Circuit, entered November 20, 1973, which: (1) vacated, without review, the judgment of the United States District Court for the Northern District of Ohio that respondent, Firestone, had perpetrated a fraud on the federal courts; and (2) reversed the district court's judgment that Firestone was not licensed under General's patent.

OPINIONS BELOW.

The opinion of the Sixth Circuit is reported at 489 F. 2d 1105, and reproduced in Appendix A, *infra*, p. 1a.

The opinion of the United States District Court for the Northern District of Ohio (the "Cleveland court") relating to the

issue of Firestone's fraud is reported at 349 F. Supp. 333, and reproduced in Appendix B, *infra*, p. 61a. The opinion, findings and order of that court relating to the license issue are reported at 349 F. Supp. 345 and 351 F. Supp. 872, and reproduced in Appendix C, *infra*, p. 85a.

The opinions of the United States District Court for the District of Maryland (the "Baltimore court") and the Fourth Circuit relating to the issue of Firestone's fraud are reported at 264 F. Supp. 291, and 373 F. 2d 361, respectively, and are reproduced in Appendices D and E, respectively, *infra*, pp. 247a and 261a.

JURISDICTION.

The jurisdiction of this Court is invoked under 28 U. S. C. § 1254(1). The judgment of the Sixth Circuit was entered November 20, 1973, and rehearing was denied January 15, 1974.

QUESTIONS PRESENTED.

1. Consistent with due process and the orderly administration of justice in the federal courts:

(a) Must a transferee district court accord *res judicata* effect to findings of fact entered by a transferor district court in support of an interlocutory decision which was reversed, on *mandamus*, by the transferor court of appeals; and

(b) When the transferee district court, acting at the invitation of the transferor court of appeals, does not accord *res judicata*, and, on a different record, decides an issue of fraud on the courts contrary to the findings of the transferor district court on this issue, may the transferee court of appeals leave this important public issue in limbo by failing to review the findings of either the transferee or transferor district courts?

2. Whether a private litigant has standing to assert for its own benefit an alleged right of the United States when the

Government has disavowed any such right in its role as administrator of a comprehensive statutory scheme?

3. Whether this Court should resolve the conflict between the Sixth Circuit's decision and the decisions: (a) of the Court of Claims regarding the proper standards of Government contract interpretation; and (b) of the Supreme Court regarding the unlicensed use of staple articles of commerce in patented combinations?

STATUTES INVOLVED.

50 U. S. C. Appendix §§ 1921-38[1]: Domestic Rubber-Producing Industry (The Rubber Act of 1948).

§ 1921. CONGRESSIONAL DECLARATION OF POLICY.

It is the policy of the United States that there shall be maintained . . . a technologically advanced and rapidly expandible (sic) rubber-producing industry in the United States of sufficient productive capacity to assure the availability in times of national emergency of adequate supplies of synthetic rubber. . . . It is further declared to be the policy of the Congress that the security interest of the United States can and will best be served by the development within the United States of a free, competitive synthetic-rubber industry. . . .

* * * * *

§ 1925. RESEARCH AND DEVELOPMENT.

(a) To effectuate further the policies set forth in [section 1921 of this Appendix] with respect to a technologically advanced domestic rubber-producing industry, continuous and extensive research by private parties and the Government is essential. The Government is authorized to undertake research in rubber and allied fields . . . by such departments, agencies, officers, Government corporations, or instrumentalities of the United States as the President may designate. . . .

* * * * *

1. The full text of 50 U. S. C. Appendix §§ 1921-38 is reproduced in Appendix F, *infra*, p. 281a.

§ 1936. DEFINITIONS.

For the purposes of this Act . . .

(b) The term "synthetic rubber" means any product of chemical synthesis similar in general properties and applications to natural rubber, and specifically capable of vulcanization, . . .

(c) The term "general-purpose synthetic rubber" means a synthetic rubber of the butadiene-styrene type generally suitable for use in the manufacture of transportation items such as tires or camel-back, as well as any other type of synthetic rubber equally or better suited for use in the manufacture of transportation items such as tires or camel-back as determined from time to time by the President;

(d) The term "special-purpose synthetic rubber" means a synthetic rubber of the types now known as butyl, neoprene, or N-types (butadiene-acrylonitrile types) as well as any synthetic rubber of similar or improved quality applicable to similar uses, as determined from time to time by the President;

* * * * *

50 U. S. C. Appendix § 1941 et seq.[2]: Disposal of Government Owned Rubber-Producing Facilities (The Rubber Producing Disposal Act of 1953).

§ 1941. CONGRESSIONAL DECLARATION OF POLICY.

It is declared that disposal of the Government-owned rubber-producing facilities pursuant to the provisions of this Act . . . is consistent with the national security and will further effectuate the policy set forth in section 2 of the Rubber Act of 1948, as amended [section 1921 of this Appendix] with respect to the development within the United States of a free, competitive, synthetic rubber industry.

* * * * *

§ 1941o. CRITERIA FOR DISPOSAL RECOMMENDATIONS.

The following criteria, together with such other criteria as the Commission deems necessary or desirable to best

2. The full text of 50 U. S. C. Appendix § 1941 *et seq.* is reproduced in Appendix F, *infra*, at p. 298a.

effectuate the purposes of this Act . . . shall be used by the Commission in arriving at its recommendations for disposal:

(1) That the disposal program be designed best to afford small-business enterprises and users, other than the purchaser of a facility, the opportunity to obtain a fair share of the end products of the facilities sold and at fair prices;

* * * * *

(3) That the recommended sales shall provide for the development within the United States of a free, competitive, synthetic rubber industry, and do not permit any person to possess unreasonable control over the manufacture of synthetic rubber or its component materials;

* * * * *

STATEMENT OF THE CASE.

A. Proceedings Below.

On December 13, 1960, General sued Goodyear and Uniroyal in Cleveland for infringement of its patent covering tires and tire treads. On March 30, 1961, Firestone and its then co-plaintiff, McCreary Tire & Rubber Company, sued General in Baltimore seeking a declaration of invalidity and license under the same patent. On April 4, 1961, General sued Firestone in Cleveland for infringement of this patent, to join it with Goodyear and Uniroyal. The Baltimore and Cleveland cases proceeded in the two district courts until January 12, 1967, when the Fourth Circuit ordered the Baltimore case transferred to Cleveland.

(1) In Baltimore.

General attempted to transfer the Baltimore case to Cleveland in 1961, again in 1963, and again in 1966. The 1966 motion was based on newly-discovered evidence of fraud, consisting of false representations made to the Baltimore court by Firestone in its earlier successful attempts to prevent transfer. This motion was

denied by the Baltimore court, who entered findings in support of its interlocutory ruling. On *mandamus,* however, the Fourth Circuit, *en banc,* unanimously *reversed* the Baltimore court, vacated its order, and ordered the case transferred to Cleveland despite nearly *three years* of *trial* in Baltimore. In transferring the case, the Fourth Circuit stated it was not "denigrating the importance of [General's fraud charges] in the ultimate assessment of costs between the parties."

(2) In Cleveland.

On General's motion after transfer, the Cleveland court considered the fraud charges and found that Firestone had perpetrated an "extremely serious" fraud, consisting of false representations made to the transferor Baltimore court. On appeal, the Sixth Circuit *vacated* the Cleveland judgment of fraud, on the ground that the Cleveland court "should not have proceeded to determine such charges." The Sixth Circuit did not review the merits of the fraud issue, as found by *either* the Cleveland *or* Baltimore courts.

Following trial, the Cleveland court held General's patent covering tires and tire treads valid and infringed, and this decision was affirmed by the Sixth Circuit.[3]

However, in the absence of the United States and contrary to the express position of the Government, Firestone had also contended it had a free license to use General's patent under the terms of a synthetic rubber Research Contract entered into between General and the Government pursuant to statute. The district court held that "the contract excludes the license Firestone seeks," and that its interpretation of the contract was consistent with the expressed intentions of the Government. The Sixth Circuit reversed, holding that the district court erred in

3. The industry has acknowledged the patent: Armstrong, Carlisle, Cooper, Gates, Hercules, Michelin, Schenuit, Semperit and five Japanese tire manufacturers by way of license without suit; and Denman, Dunlop, Goodrich, Goodyear, Mansfield, McCreary, Mohawk, Seilon, and Uniroyal by way of settlement prior to trial.

considering the Government's intent, and that Firestone was licensed under General's contract.

General seeks certiorari on two issues. One is Firestone's fraud on the federal courts, found by the Cleveland court and vacated without review by the Sixth Circuit. The other is Firestone's claim to a royalty-free license, denied by the Cleveland court but granted by the Sixth Circuit.

B. The Fraud Issue.

Firestone's fraud pertains to its tactics in prosecuting the Baltimore suit and particularly to its false representations to the Baltimore court in opposing General's first motion to transfer the case to Cleveland. The key facts are set out concisely in the opinion of the Fourth Circuit at 268-75a.

(1) The "Backfire" Plot.

After General had sued Goodyear and Uniroyal in Cleveland, counsel for Goodyear, Uniroyal, and Firestone met to chart a course of action. A memo of this meeting, kept by counsel for Firestone, shows that counsel for Uniroyal stated the object:

"Want to start backfire and keep it burning—Where How."

The memo further shows that the parties feared any "backfire" suit would be transferred to Cleveland. Counsel for Uniroyal considered the prime problem to be how to "make case stick", and counsel for Goodyear stated there was a "Good Case for Transfer".[4]

Despite the odds favoring transfer, the "backfire" was started by Firestone's suing General in Baltimore. Firestone added a co-plaintiff (McCreary) whom it considered immune from suit in Cleveland to help counter the clear case for transfer to Firestone's home (and General's) in the Cleveland district, where it could be consolidated with the Goodyear and Uniroyal cases.

4. This memo is set out in the opinion of the Fourth Circuit at 269a.

McCreary was brought in after Firestone had called its president, Mr. McCreary, Sr., on the morning the suit was filed and told him of the plan. Mr. McCreary agreed, stating that he would "try to show my appreciation by being just as active in this thing as I think you want us to be," that McCreary would "take care of our travel bills and stuff like that," and that McCreary would "be guided by your office 100%."[5]

(2) The Plot to Deceive the Baltimore Court.

As Firestone had anticipated, General moved to transfer the Baltimore case to Cleveland on May 5, 1961. On May 9th, counsel for Firestone called Mr. McCreary, Sr., with a proposition. Unknown to Firestone, Mr. McCreary made a tape recording of this conversation. The substance of the proposition was that General's motion to transfer had created a problem in that:

> ". . . we think they're probably trying to line up to say in the long run that McCreary can be transferred out because they are just Firestone's little patsy, and Firestone is paying the whole bill.
>
> "Now, here is what we'd like to do, if it's all right with you, *with full recognition that the agreement that was made between you and* [an officer of Firestone] *is not going to, in the long run change one tiny little bit.* I don't want to put anything in the mail, and I don't want to talk about it too much, for obvious reasons.
>
> * * * * *
>
> "So what we would like to do would be to formally bill you folks for 1 percent of the cost of this litigation . . . just as if . . . Firestone didn't even exist . . . Bearing in mind that . . . after this is all over with, why, everything will come out in the wash."[6]

5. A transcript of this conversation is set out in the opinion of the Fourth Circuit at 271-72a.

6. A transcript of the recording is set out in the opinion of the Fourth Circuit at 272-74a. Emphasis added throughout.

McCreary was also informed that the purpose of the billing arrangement was to permit an affirmative answer to an expected interrogatory from General asking whether McCreary was paying its toll in the lawsuit, and to this end it was arranged that McCreary would be *back billed* for the months of March and April.

(3) Carrying Out the Plot.

General's motion to transfer was heard and denied July 6, 1961. At the hearing, Firestone represented to the Baltimore court that:

> "He [McCreary] comes here jointly as plaintiff with Firestone, but other than that, independent, he pays my bills as I send them to him. . .
>
> "He is here because he can't, in good conscience and good business judgment, continue his business with this cloud over him.
>
> "As to McCreary, it is, in my mind, wholly obvious that these defendants [sic] have no case for transfer. The home forum argument doesn't apply.
>
> * * * * *
>
> "He [McCreary] can, perhaps, derive some benefit from his association with Firestone, but he comes here independently, and not as Firestone's agent or cat's paw, and I think that should be clearly understood."

The reaction of the Baltimore court to McCreary's presence in the suit is apparent from its statement that McCreary was "perhaps conclusive on transfer."

(4) The Mandamus Proceedings in the Fourth Circuit.

The McCreary tape was found in a sealed envelope among the effects of its president after his death. Counsel who was independent of Firestone was called in and the tape played in his presence. After hearing the tape, McCreary promptly replaced its trial counsel with this independent counsel who produced the tape to the court in Baltimore on April 18, 1966, stating:

> "I appear today upon a matter which is to me of the utmost gravity. I deem it my professional duty to appear and state certain facts to this Court upon the record. I do so with the full knowledge and approval of my client."

At that time, General was awaiting a decision from the Fourth Circuit on a petition for writ of *mandamus* relating to another issue in this case. Counsel for McCreary, citing the duty imposed by *Precision Instrument Mfg. Co.* v. *Automotive Maintenance Mach. Co.*, 324 U. S. 806, 818 (1945), together with General, submitted the tape and the other evidence of misrepresentations to the Court of Appeals. In its *en banc* opinion the Court stated:

> "It is suggested that there was falsity in the plaintiffs' representations—in opposition to General's original motion to transfer the case to Ohio—that McCreary was an independent party prosecuting the case at its own expense. These representations may well have been the determinative factor in the denial of the transfer motion. If they were in fact untrue, it appears that the plaintiffs may have practiced a serious fraud upon the District Court.
>
> * * * * *
>
> "After the District Court has acted upon an amplified record, this court can entertain any issue appropriately brought up for review." (363 F. 2d 87, 89-90.)

General then filed a renewed motion to transfer or dismiss on the grounds of fraud. The Baltimore court denied General's motion and, in support of its order, entered findings that no fraud had been committed. On subsequent *mandamus*, the Fourth Circuit, again *en banc*, pointedly questioned Firestone's counsel regarding the fraud issue[7] and unanimously *reversed*

7. Pertinent portions of this examination are reproduced in Appendix G. *infra*, p. 325a. The questions put by Judge Haynesworth to Firestone's counsel include:

> "If there was no understanding, what was the agreement with [Firestone's officer] that was not going to change 'one tiny little bit'?
>
> * * * * *
>
> "But isn't this a fact that it is in the tape, 'I don't want to put

the Baltimore court's decision and *vacated* its order denying transfer to Cleveland. With respect to the fraud issue, the Fourth Circuit stated:

> "*We* do not feel it advisable *at this stage* in the lawsuit to pass on the district court's findings and conclusions with respect to General's contentions of bad faith and misrepresentation to the court. *Without denigrating the importance of these issues in the ultimate assessment of costs between the parties,* we think that their resolution in favor of Firestone should not have been determinative of the motion to transfer." (373 F. 2d 361, 368; 275a.)

(5) The Proceedings in the Sixth Circuit.

It was in this posture that the fraud issue came to the Cleveland court. That court concluded that the Fourth Circuit "intended to transfer this case unbound by prior determinations" and agreed to consider General's motion to dismiss Firestone's declaratory action on the grounds of fraud. The issue, as stated by the Cleveland court, was:

> ". . . whether General has shown by clear and convincing evidence that Firestone misrepresented certain facts concerning McCreary's relationship with Firestone in order to prevent a transfer of the case of Cleveland." (71a.)

After a full hearing and consideration of a record different from that before the Baltimore court, the Cleveland court found that Firestone had been guilty of fraud; dismissed the declaratory action; consolidated all remaining issues with the infringement action; and left for an accounting the decision whether to award attorneys' fees to General and impose sanctions against Firestone.

The Sixth Circuit did not review this fraud issue. It disposed of the Cleveland court's decision by stating that it "should

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> anything in the mail and I don't want to talk about it too much for obvious reasons'? Doesn't that strongly suggest that the understanding was pretensive?"

The Cleveland court examined this transcript and stated that it "seems clear that Judge Haynesworth was not convinced by the explanation." (349 F. Supp. 333, 338; 69a.)

not have proceeded to determine" the fraud issue. It did not discuss or examine the merits; it did not state that there was either a lack of power or an abuse of discretion by the Cleveland court, nor that that court reached the wrong decision; it did not reinstate, nor review the Baltimore court's findings. It either improperly left this issue in limbo, or mistakenly applied *res judicata* to the interlocutory findings of the Baltimore court.

C. The License Issue.

The Sixth Circuit affirmed the district court's decision that General's patent is valid and infringed, but reversed its decision that Firestone is not licensed, royalty-free, under a Research Contract between General and the Government.

(1) The Background.

Prior to World War II, the United States depended upon natural rubber obtained from the Far East. When hostilities threatened that source, Reconstruction Finance Corporation was authorized to produce synthetic substitutes.

RFC contracted for the design and construction of a series of Government-owned and contractor-operated synthetic rubber plants. Some produced "general purpose" synthetic rubber, *i.e.*, rubber of general usefulness in producing items such as tires, automotive moldings, hose, belting, and gaskets. Others made "special purpose" synthetic rubbers, *e.g.*, inner tube rubber (which has to be air impermeable) and oil-resistant rubber. The product of these plants was a bale of synthetic rubber—a staple article of commerce.

Thus, the Government created a synthetic rubber industry which was a basic raw material supplier. However, the Government never owned or operated any plants which further processed the synthetic rubber and other ingredients in mixers,

mills, and extruders according to varying recipes and procedures to make the desired finished products.[8]

General operated the Government's Baytown, Texas, synthetic rubber plant from 1943 to 1955. The output of this plant was bales of general purpose synthetic rubber known as black rubber or black masterbatch rubber because carbon black was added while the rubber was in the latex state.

(2) The Rubber Act of 1948.

Following World War II, Congress enacted the Rubber Act of 1948 (50 U. S. C. App. § 1921 *et seq.;* 283a). Its purpose was to get the Government out of the synthetic rubber business, but at the same time to assure that the industry would remain viable in the hands of private, freely competing parties. To that end, the Act provided for a transition period during which the Government was authorized to undertake research to improve the quality of synthetic rubber (§ 1925) and to continue to make and sell it (§ 1926(b)). At the same time, Congress recognized that "extensive research by private parties" was also essential to a "technologically advanced domestic rubber-producing industry." (§ 1925). This Act was the statutory basis for the Government's operational and research activities in the synthetic rubber industry.

(3) The Research Contract.

Pursuant to the Rubber Act, RFC entered into a number of Research Contracts, one being with General. General's contract (55a) was executed in January, 1950, effective as of January, 1949.

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8. This distinction between the synthetic rubber-producing industry and the rubber-consuming industry is well-recognized. For example, the Government's Standard Industrial Classification Manual has classified synthetic rubber manufacturers with "chemical establishments" in Group 282, and has classified manufacturers of "rubber products", in the separate industrial group, 301.

Paragraph 3 of the contract defined and limited the scope of research to developing principles and techniques for the production of synthetic rubber:

> "3. The applied and developmental Research Work to be conducted hereunder shall be directed to the determination of generally accepted principles for, and to the adaptation of such principles to techniques for, the *production* of rubber-like polymers of butadiene, and of rubber-like copolymers, mixed polymers and interpolymers of butadiene with styrene; . . . [and] includes carbon black masterbatches [the output of the Baytown plant]. . . ."

Paragraph 7 of the contract contains the license granting provisions. The Cleveland court held that it did not apply to General's patent or Firestone's infringing activities. The Sixth Circuit held that paragraph 7(2) did apply:

> "Contractor hereby grants to RFC and its nominees . . .
>
> * * * * *
>
> ". . . a royalty-free license to use any information or invention [within the scope, as defined by paragraph 3, of authorized research], . . . *but limited* to the utilization of the same in the production, use or sale of general purpose synthetic rubber *suitable for use* in the manufacture of transportation items such as tires or camel-back."[9]

A simple side-by-side comparison of the patent's claims and paragraph 7(2) of the Research Contract negates a reading of that license onto the claims of General's patent which are directed not to the production of synthetic rubber but to tires and tire treads.

(4) The Government's Nominees.

In 1953 Congress determined that the synthetic rubber industry was strong enough to stand on its own in a freely-competitive climate. Accordingly, it enacted the Rubber Producing Facilities

9. The qualification, "suitable for use in the manufacture of transportation items," is the statutory definition of general purpose rubber contained in the Rubber Act of 1948 (50 U. S. C. App. § 1936 (c)). It distinguishes that rubber from "special purpose rubbers" also defined in the Act (50 U. S. C. App. § 1936(d)).

Disposal Act which set the policy for the sale of the Government's synthetic rubber plants to private companies. Firestone purchased two of the Government synthetic rubber plants in 1955. In connection with those purchases, but without any separate consideration therefor, Firestone was named a "quit-claim" nominee under dozens of Government research contracts. That is, without any recitation of particular patents, the Government made Firestone a nominee to whatever the Government may have acquired.

The purpose of making synthetic rubber plant purchasers nominees was to "assure to plant purchasers the patent rights and technical information necessary to the continuance of operations" which "should prove adequate to establish plant purchasers on a sound technological footing *for the production* of *synthetic rubber.*"[10]

(5) The Application of the Research Contract to Firestone's Infringing Activities.

Firestone's infringing acts are its making and selling: (1) pneumatic tires having a particular tread portion composition; and (2) tire tread stock of the same composition used, for example, as tread recap. General's representative patent claims covering Firestone's "pneumatic tire" and "tire tread stock" are claims 1 and 18, respectively (Appendix A, 52a, 53a). Complete recipes for the tread compounds are set out in the patent, *e.g.*, at Column 18. (50a.)

(6) The Decision of the Sixth Circuit.

The Sixth Circuit held that "General's invention clearly was a 'general purpose synthetic rubber suitable for use . . . in tires. . . .'" (36a), and thus that it was within the license grant

10. RFC Report to the President and Congress on the "Program for Disposal to Private Industry of Government-owned Rubber-Producing Facilities" (March 1, 1953).

of paragraph 7(2) of the Research Contract.[11] It went on to hold that the license covered not only the right to make, use, and sell that staple article of commerce (a general purpose synthetic rubber), but to make, use, and sell other articles of commerce which are patented combinations in which that synthetic rubber is suitable for use. The Sixth Circuit made its decision in the absence of any participation by the United States, and refused to consider the interpretation placed on the Research Contract by the Government both before and after its execution.

REASONS FOR GRANTING THE WRIT.

A. Arising From the Fraud Issue.

(1) The Need for Inter-Circuit Supervision and Guidelines.

Transfers under 28 U. S. C. § 1404 and 28 U. S. C. § 1407 have increased, according to statistics of the Administrative Office of the United States Courts, to well over 1,000 per year. As these transfers have increased, so have the problems of inter-circuit and inter-district jurisdiction, comity, and conflicts within a given case. In this context, the fraud issue presents important questions of broad applicability not previously decided by this Court.

The first question is whether a transferee district court has jurisdiction finally to decide an issue which has previously been passed upon by the transferor district court in an *interlocutory* proceeding. We submit that it does, consistent with the law in the First, Second, Fifth, Seventh, Eighth, Tenth, and D. C. Circuits. *Zdanok* v. *The Glidden Company*, 327 F. 2d 944, 952-53 (2nd Cir. 1964); *Higgins* v. *California Prune & Apricot Growers*, 3 F. 2d 896, 898 (2nd Cir. 1924); and *Bowles* v. *Wilke*, 175 F. 2d 35, 37 (7th Cir. 1949).

11. The correct statement of the invention is contained in the District Court's Findings 91-96 and particularly 95 (157a), which were accepted by the Sixth Circuit. The invention is a *tire tread* made from a novel interacting combination of ingredients in defined proportions.

See also, cases cited in 1B MOORE'S FEDERAL PRACTICE, § 0.404[1], at 405-06 (2nd ed. 1974). As these cases show, the "law of the case" does not bind a judge or prevent him from re-examining an interlocutory decision in a pending case, and the rule should be no different when the case is transferred to a judge of concurrent jurisdiction in a different district.

Nevertheless, the Sixth Circuit vacated the Cleveland court's judgment on the fraud issue because it "should not have proceeded to determine such charges". (38a.) This is a harkening back to what Professor Moore calls the discredited "older view" of earlier federal cases "to the effect that the law of the case has the effect of res judicata." (MOORE, *supra*, at 405).

Moreover, the Baltimore court's decision was not only interlocutory; it was *reversed* and *vacated* by the Fourth Circuit. It would be strange for the Sixth Circuit to apply *res judicata* to a decision and order which were reversed and vacated. It would be unprecedented to apply *res judicata* to the Baltimore *findings*, especially in the face of the express statement of the Fourth Circuit that it was not "denigrating" the fraud issue in the "ultimate assessment of costs between the parties." Yet it appears that the Sixth Circuit has done just that, thereby doing more than creating a conflict with a majority of the Circuits and returning to the "older view". It has applied *res judicata* to a *vacated* district court judgment and has denied any appellate review of that judgment.

It may be argued that the Sixth Circuit was not denying the Cleveland court's *power* to act, but rather holding that it had abused its discretion. The Cleveland court gave serious consideration to whether it should re-examine the fraud issue. Its decision to re-examine was based on its proper reading of the Fourth Circuit's decision as a transfer of the case unbound by prior determinations and without any "freely-floating findings" attached. (67a.) Considering the langauge of the Fourth Circuit, the Cleveland court certainly did not abuse its discretion.

The Sixth Circuit did *not* state that the Cleveland court had abused its discretion, but even if it had, the Sixth Circuit should have reviewed the merits of the fraud issue, if not as found by the Cleveland court, at least as found by the Baltimore court.

The decision of the Sixth Circuit, if based on a theory of *res judicata*, was in conflict with the decisions of a majority of the Circuits and in clear violation of federal law. If based on a theory of abuse of discretion, the decision was also in violation of federal law, because the vacation of the Cleveland decision would not end the obligation of appellate review, in any case. If the Sixth Circuit intended to reinstate the previously vacated Baltimore decision, it should have so stated and reviewed that decision. Since it did not reinstate nor review the Baltimore decision, and did not review the Cleveland decision, the fraud issue has been left in limbo with *no* appellate review.

The Fourth Circuit and Sixth Circuit have both avoided review of the fraud issue on the merits. The Cleveland and Baltimore courts have sharply differed on the merits of that issue. Only this Court can now resolve this serious inter-circuit conflict and in so doing set guidelines for the federal courts which will prevent such conflicts in the thousands of cases which will be transferred in the future.

(2) The Need for Review of the Standards of Trial Advocacy in the Federal Courts.

In addition to showing the need for this Court's exercising its supervisory responsibility with respect to the inter-circuit questions discussed above, this case also calls for a redrawing by this Court of the lines and bounds of proper trial advocacy.

Firestone's filing of the declaratory action in Baltimore as a "backfire" needlessly duplicated and disrupted the efforts of the Cleveland court. If Firestone simply wanted a judicial determination of its rights, it could have accomplished that purpose in Cleveland, where it and General are headquartered and where all suits could have been consolidated. Instead, this

major case proceeded concurrently in two courts for nearly six years. Three years were spent *in trial* in Baltimore, disrupting that court's docket and creating a serious backlog of untried cases. In the words of the Fourth Circuit, the effect was:

> ". . . an extravagantly wasteful and useless duplication of the time and effort of the federal courts by the simultaneous trial of two complex and elaborate cases involving substantially the same factual issues." (373 F. 2d 361, 362; 264a.)

This "useless duplication" was made possible by Firestone's fraud in preventing transfer of the Baltimore case. As the Fourth Circuit pointed out, its refusal to order transfer on General's earlier *mandamus* petition was premised on the fact that McCreary:

> ". . . was an *independent coequal* party plaintiff against whom alone a patent suit could not be brought in Ohio for reasons of venue." (373 F. 2d 361, 362; 264a.)

But, McCreary was *not* an "independent coequal party," as Firestone repeatedly represented to the courts. Firestone asserted McCreary's independence, while concealing the fact that McCreary was to be "as active in this thing as you want us to be" and "guided by your office 100%." Further, Firestone supported its assertions of McCreary's independence by stating that McCreary "pays my bills as I send them to him," while concealing its real agreement with McCreary, which was not changed "one tiny little bit" by this sham billing arrangement. The Cleveland court found that Firestone's representations were false and constituted a serious fraud on the courts, in line with this Court's holdings in *Keystone Driller Co.* v. *General Excavator Co.*, 290 U. S. 240 (1933); *Hazel-Atlas Glass Co.* v. *Hartford-Empire Co.*, 322 U. S. 238 (1944); and *Precision Instrument Mfg. Co.* v. *Automotive Maintenance Mach. Co.*, 324 U. S. 806 (1945). *Hazel-Atlas*, at 246, is particularly apt:

> ". . . tampering with the administration of justice in the manner indisputably shown here involves far more than

> an injury to a single litigant. *It is a wrong against the institutions set up to protect and safeguard the public, institutions in which fraud cannot complacently be tolerated consistently with the good order of society.*"

The Sixth Circuit, in side-stepping the fraud issue, overlooked the importance of resolving that issue to the public welfare and the "good order of society". If this Court does not take the case, Firestone's conduct will stand unreviewed, with the result of uncertainty in the standards of conduct which will be tolerated in practice before the federal courts and consequent damage to the administration of justice.

B. Arising from the License Issue.

(1) Firestone's Standing to Assert a License in the Absence of the United States.

General moved to dismiss Firestone's license defense on the ground that the United States was not a party. This motion was denied April 14, 1962. On January 3, 1963, General filed a declaratory action against the United States seeking a declaration of rights under its Research Contract. (C. A. 14,333, D. Md. 1963.) The Government was successful in having that action dismissed *for want of any controversy*.

The United States is not and has never been a party to these proceedings. It has never asserted a license under General's patent. It has taken the position, both before and after the contract was signed, that it was *not* licensed under General's invention.[12] It is *Firestone* who has argued that the Government has a license and that therefore Firestone has a license as the Government's nominee.

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12. In his memo of the March 17, 1961, meeting with Goodyear and Uniroyal, Firestone's counsel noted a proposal to approach the Attorney General "to *reverse* position of Justice Department in respect to whether General Tire patent is within General Tire research contract." For the Government's position before execution of the contract, see pp. 24-25, *infra*.

By the Rubber Act of 1948 and the Disposal Act of 1953, Congress vested solely in the Executive the responsibility to make the policy decisions required for uniform and fair administration of the comprehensive legislative schemes embodied in those Acts, which controlled the Government's ownership, operation, and disposal of the synthetic rubber industry and the conduct of research therein.

The principle involved here is akin to the doctrine of primary jurisdiction, first enunciated by this Court in *Houston* v. *St. Louis Independent Packing Co.*, 249 U. S. 479 (1919) and subsequently in *United States* v. *Western Pacific R. R. Co.*, 352 U. S. 59 (1956) and *Pan American World Airways, Inc.* v. *United States*, 371 U. S. 296 (1963). That doctrine applies when, as here, Congress has entrusted to the Executive the responsibility for administering a comprehensive statutory scheme, and uniformity of administration is essential to accomplishing the Congressional intent. In such a situation, the doctrine of primary jurisdiction provides that the Judiciary should not act in the absence of the Executive, even though it has jurisdiction to do so.

A danger in permitting Firestone to purport to administer the policy of the United States while serving its own end in a private lawsuit is that the policy may be subverted, as it was in this case. Firestone was made a nominee because it was able to buy a Government synthetic rubber plant. The intention of the Government in making Firestone and the other synthetic rubber plant purchasers nominees was to secure to them adequate "patent rights and technical information" to establish them "on a sound technological footing *for the production of synthetic rubber.*" (p. 15, *supra.*)

The Sixth Circuit has gone beyond this intention and has given Firestone free rights to make tires as well. *Firestone, Goodyear, and Uniroyal are the only tire producers who qualify for this windfall.* Small companies, such as Mohawk, Dunlop, Mansfield, and others, do not qualify and were unable to raise

the license defense to General's infringement actions against them. This result is the exact opposite of the intention of Congress, whose *major concern* in selling the Government's synthetic rubber plants was to protect smaller manufacturers.

Another danger in permitting private parties to purport to administer the policy of the United States in private lawsuits is that the policy may be applied nonuniformly, as was also the case here. Goodrich, like General, was a party to a Government research contract. During the contract period, it acquired a process for synthesizing natural rubber. Like General's, this work was not paid for by the Government. Like General's, Goodrich's standard research contract provided for a royalty-free license to the Government and its nominees.

In resolving a dispute over whether the Goodrich invention was within the research contract, the United States entered into a consent decree in 1960 whereby Goodrich was required to license its invention to others, not royalty-free but *at a reasonable royalty*.[13] Thus, it was the *United States* and not a private nominee who discharged the policy of the United States in administering the Rubber Act of 1948 and in determining the equitable distribution of rights to research conducted thereunder.

No nominee under the Goodrich research contract would have standing, in an infringement suit brought by Goodrich, to challenge the Government policy expressed in the consent decree. Nor did Firestone have standing here to set Government policy in the absence of the United States and in the face of the United States' refusal to assert any rights under General's patent.

To obtain uniformity and fairness in administering comprehensive legislative schemes, it is essential that the policy decisions be made by the Executive, not private corporations, and that the judicial determinations regarding this policy not be made in the absence of the United States. This problem did not

13. *United States* v. *B. F. Goodrich Co.*, C. A. 1106-57 (D. D. C. 1957).

die with the Rubber Act of 1948. It is an equally important problem with respect to each of the many comprehensive statutes now in force and to be enacted, in the field of Government research and elsewhere.

This Court should grant certiorari to clarify the standing of a private litigant to purport to administer United States' policy in its private interest and of the Judiciary to declare United States' rights or liabilities in the absence of the Executive.

(2) The Conflict with the Court of Claims' Standards of Government Research Contract Interpretation.

Beginning at least as early as *Mine Safety Appliances Co.* v. *United States,* 364 F. 2d 385 (Ct. Cl. 1966) and extending through *W. G. Cornell Co. of Washington D. C., Inc.* v. *United States,* 376 F. 2d 299 (Ct. Cl. 1967), *Technitrol, Inc.* v. *United States,* 440 F. 2d 1362 (Ct. Cl. 1971) and *Firestone Tire & Rubber Co.* v. *United States,* 444 F. 2d 547 (Ct. Cl. 1971) to the most recent case of *Technical Development Corp.* v. *United States,* ..... F. 2d ....., 179 U. S. P. Q. 180 (Ct. Cl. 1973), the Court of Claims has followed a liberal rule for the interpretation of Government research contracts, in which the surrounding circumstances, evidence of trade usage, custom, and practice, and intentions of the parties are examined as well as the contract language itself to properly interpret the contract. *See* Davis, "Patent Licenses Under Government Contract: New Judicial Scrutiny" 55 J. PAT. OFF. SOC'Y. 503 (August, 1973).

As stated in *Firestone, supra* at 551-52, "the intention of the parties to a contract control its interpretation" and this rule *"has attained an even greater measure of significance in the complex field of Government contracts."*

This rule has been applied to most Government research contract disputes because the Court of Claims is the forum for presentation of such disputes in the ordinary course.[14] The Sixth

14. The Court of Customs and Patent Appeals also has occasion to deal with these disputes. See *Fitch* v. *Atomic Energy Commission,* ..... F. 2d ....., 181 U. S. P. Q. 41 (C. C. P. A. 1974).

Circuit, in departing from this rule, is in square conflict with the decisions of the Court of Claims, and it acknowledged that it was ruling contrary to "the trend toward liberality" as expressed in the Restatement of Contracts, by Professors Corbin and Wigmore, and by the Ninth Circuit. (37a.)

Specifically, the Sixth Circuit held that the district court erred in considering the Government's intent in interpreting the contract. The district court examined the documented contract negotiations to determine the intent of the parties on the issue of *implied* license[15], which is proper. *See, Corbett* v. *Winston Elkhorn Coal Co.*, 296 F. 577, 579 (6th Cir. 1924) and *Owensboro Ditcher & Grader Co.* v. *Markham*, 32 F. 2d 564, 566 (6th Cir. 1929). The district court also found that the intent of the parties was in accord with the court's interpretation of the contract on the express license issue. Findings 217-18, 349 F. Supp. 345, 409 (221-25a). This standard of interpretation is in accord with that applied by the Court of Claims.[16]

The material excluded by the Sixth Circuit shows conclusively that the intent of the Government was to negate the very license Firestone has been awarded. The excluded material pertains to the negotiations between General and the Government just prior to execution of the Research Contract.

On November 20, 1949, the Government submitted a draft contract to General which would have granted the Government rights in the manufacture of tires. General *rejected* the draft, as did the others who were negotiating with the Government.[17]

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15. See the district court opinion at 349 F. Supp. 345, 362. (113a.)

16. It is also in accord with Ohio Law. See *New York Central R. R. Co.* v. *General Motors Corp.*, 182 F. Supp. 273, 285 (N. D. Ohio, 1960); *Butler Produce & Canning Co.* v. *Edgerton State Bank Co.*, 112 N. E. 2d 23, 26 (1953); *West* v. *Ankney*, 134 N. E. 2d 185, 187 (C. P. Paulding, 1956); and *Worthington, Murfey & Co.* v. *S. Korach Co.*, 70 O. L. Abs. 157 (App. 8th, 1929).

17. The Government was concurrently negotiating research contracts with the Big Four tire manufacturers and others. Its aim (which it accomplished) was to arrive at a standard research contract.

The Government submitted a revised draft on November 23, 1949, which *deleted* coverage of tires and limited its license rights to the production of synthetic rubber. On December 7, 1949, General wrote to the Government asking whether the draft covered the "use that might be made of the licensed material in other patentable combinations". On December 9, 1949, the Government negotiator told General that the license only covered *production* of synthetic rubber, *not* products made from that rubber.

Following this conversation, the Government sent General a proposed form agreement it had worked out with Firestone that limited the Government's rights to the production of general purpose synthetic rubber, and stated to General that the Firestone agreement "substantially answers the questions you raise in your letter of [December] 7th".

General accepted the Firestone form of agreement and, by letter of December 16, 1949, reaffirmed its understanding that the license rights "do not refer to the subsequent use of the product in other patentable combinations". The Government's copy of this letter bears the notation "O. K." in the margin bracketing General's quoted statement.[18]

By the Court of Claims standards, the above circumstances would have been examined. They were emphatically *excluded* by the Sixth Circuit.

Government research contracts, of which there are thousands entered into in various locations throughout the country, ought to be interpreted by the same standards, whether considered in the Court of Claims, Court of Customs and Patent Appeals, or District and Circuit courts. This Court should grant certiorari to resolve the conflict between the Court of Claims and the Sixth Circuit and settle the law with respect to the standards to be applied by the federal courts in interpreting Government research contracts.

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18. Findings 216-18 (221-25a) pertain to these negotiations.

(3) The Conflict with This Court's Decision in the Rubber Tire Wheel Case.

General does not dispute the fact that Firestone has the right to make, use, and sell general purpose synthetic rubber—an unpatented staple article of commerce. The Sixth Circuit held, however, that "General's invention clearly was 'a general purpose synthetic rubber suitable for use . . . in tires. . . .' " and therefore that Firestone had the right to make, use, and sell these other articles of commerce (tires) even though they are patented combinations. This decision upsets the settled law laid down by the Supreme Court in 1914 in its decision in *Rubber Tire Wheel Co.* v. *Goodyear Tire & Rubber Co.*, 232 U. S. 413. That case was relied upon by General and the district court on the point here in issue, and its principle of law has been relied upon in patent licensing for 60 years, but it was not mentioned in the Sixth Circuit's decision.

Rubber Tire Wheel involved a combination patent covering a rubber-tired automobile wheel. The patent was held valid in the Supreme Court, but Goodyear had the right, arising from a final court decree in an earlier infringement action against it, to make, use, and sell the patented wheel and, of course, it had the right to freely make, use, and sell the rubber used to make the patented wheel. Because of this, Goodyear contended that its unlicensed customers, by buying its unpatented rubber which was suitable for use in the patented wheel, were free to use it to make the patented wheel and to sell that wheel. Thus, the question before the Supreme Court was whether the right to *use* an intermediate product (the rubber) extended to its use in *other* patentable combinations.

The Supreme Court stated:

> "The decree gave the respondent [Goodyear] no right to have others make [the patented] tires. It could make and sell them, and it could make and sell rubber; it could demand protection for its trade rights in the commodities it produced. But it had no transferable immunity in manu-

> facture. *The decree gave it no privilege to demand that others should be allowed to make and sell the patented structure in order that it might have a market for its rubber.*" (232 U. S. at 419.)

It went on to hold that Goodyear's right to use the rubber element existed only so long as that commodity retained its *separate identity* and did not extend to the right to use that commodity to make *other* patented products. At 418-19 the Court held:

> "It is a right which attaches to its product—to a particular thing—as an *article of lawful commerce,* and it continues only so long as the commodity to which the right applies retains its separate identity. *If that commodity is combined with other things in the process of the manufacture of a new commodity, the trade right in the original part as an article of commerce is necessarily gone.*"

Applying the holding of *Rubber Tire Wheel* to the facts of this case, it is apparent that the right to freely make, use, and sell, which Goodyear had in its rubber constituent (suitable for use in a rubber-tired wheel), and which Firestone has in its unpatented general purpose synthetic rubber (suitable for use, *among other things,* in tire treads), does *not* extend to the use of those intermediate products in patented end products—the rubber-tired wheel in Goodyear's case and the tire tread in Firestone's case.

The Sixth Circuit's decision creates confusion in an area of patent licensing which the patent bar, relying upon *Rubber Tire Wheel,* has considered settled for many years.[19]

If the Sixth Circuit's decision is allowed to stand, it will also create serious problems in the area of Government-sponsored

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19. In a memo of December 7, 1949, patent counsel of RFC noted that the synthetic rubber product of the Government's plants was not itself patented. He went on to say that:

> " . . . it must not be overlooked that the greatest expected use of synthetic rubber will be for tires and tubes, and that the tires or tubes themselves, or the processes of making them, may be covered by privately owned patents, but that situation is outside the scope of this memorandum."

research. While this case deals with the Rubber Act of 1948, the questions involved are very much alive under current Acts such as the Coal Research Act of 1960; the Helium Act; the Saline Water Conversion Act of 1961; the Water Resources Act of 1964; the Solid Waste Disposal Act of 1965; and most recently, the Energy Acts.

The Government is about to embark on a multi-billion dollar research program in the field of energy, as it has already done in other fields, such as health, space, defense, and the environment. The Government expects that about twenty private research dollars will be spent in the area of energy for every Government research dollar. (President's State of the Union message to Congress, 1974.)[20] Because of their extensive background knowledge, those who have done the most in their own private research will also be looked to as major contributors to Government-sponsored research.

If the law is to be, as the Sixth Circuit says, that work done on an intermediate which is "suitable for use" in an end product conveys a license to make the end product, even if that product is separately patented, then the spill-over of Government-sponsored research work onto private developments will be impossible to predict, and the most qualified contractors will be discouraged from undertaking Government research. This factor was well-stated by Mr. James Webb, then Administrator, N. A. S. A. (Congressional Record (June 2, 1965) p. 11829), as follows:

> "For NASA to succeed in its missions, we urgently need the unrestrained cooperation of wide segments of industry. Some 20,000 contractors, prime and sub, are now at work in a wide variety of technologies. *It has been my experience that few factors discourage a contractor's unrestrained application of his best talent to a Government contract more than a patent policy which creates uncertainty and which*

20. Over the next five years the President projected a Government energy research expenditure of 10 billion dollars while he expected private enterprise to spend some 200 billion in energy research over the same period and 500 billion over the next ten years.

causes him to fear that his commercial status based on a proprietary position he has already achieved will be jeopardized."

Nor will the adverse consequences of the Sixth Circuit's departure from the *Rubber Tire Wheel* rule be limited to private industry. The Government now frequently takes title to patents resulting from Government-sponsored research rather than a free license. It therefore stands in the same jeopardy from the Sixth Circuit's ruling as do private patent owners.

CONCLUSION.

For the foregoing reasons, General respectfully submits that its petition for writ of certiorari should be granted as to each question presented.

With respect to the license issue, General respectfully suggests that it may be in order for this Court to request an *amicus* participation on behalf of the United States.

Respectfully submitted,

CHARLES J. MERRIAM,
EDWARD M. O'TOOLE,
Two First National Plaza,
Chicago, Illinois 60670,
Counsel for Petitioner.

MERRIAM, MARSHALL, SHAPIRO
& KLOSE,
Two First National Plaza,
Chicago, Illinois 60670,

TRESS E. PITTENGER,
FRANK C. ROTE,
One General Street,
Akron, Ohio 44309,
Of Counsel.

IN THE

Supreme Court of the United States

OCTOBER TERM, 1973

No. 1529

THE GENERAL TIRE & RUBBER COMPANY,
Petitioner.

vs.

THE FIRESTONE TIRE & RUBBER COMPANY,
Respondent.

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APPENDIX A

Opinion of the United States Court of Appeals for the Sixth Circuit—November 20, 1973 (489 F. 2d 1105)*

* Including as Exhibit A thereto the Patent in suit (489 F. 2d 1125) and as Exhibit B thereto Research Contract (RUR SR 40) between The General Tire & Rubber Company and Reconstruction Finance Corporation (489 F. 2d 1141).

Nos. 72-2123, 24, 25, 26

UNITED STATES COURT OF APPEALS

FOR THE SIXTH CIRCUIT

THE GENERAL TIRE & RUBBER CO.,
Plaintiff-Appellee,
v.
THE FIRESTONE TIRE & RUBBER CO.,
Defendant-Appellant.

THE FIRESTONE TIRE & RUBBER CO.,
Plaintiff-Appellant,
v.
THE GENERAL TIRE & RUBBER CO.,
Defendant-Appellee.

APPEALS from the United States District Court for the Northern District of Ohio, Eastern Division.

Decided and Filed November 20, 1973.

Before: EDWARDS, MILLER and LIVELY, Circuit Judges.

EDWARDS, Circuit Judge. This patent litigation began in 1961. It involves two proceedings. The first was a suit for declaratory judgment filed by Firestone in Baltimore, Maryland,[1] against General Tire attacking the validity of a patent

[1] The Baltimore Litigation: *Firestone Tire & Rubber Co.* v. *General Tire & Rubber Co.*, 130 U.S.P.Q. 138 (D. Md. 1961) (motion to dismiss denied and General restrained from prosecuting Cleveland case); *General Tire & Rubber Co.* v. *Watkins*, 326 F.2d 926 (4th Cir.) (petion for writ of mandamus to compel transfer to Cleveland denied), *cert. denied*, 377 U.S. 909 (1964); 331 F.2d 192 (4th Cir.) (motions for writ of mandamus and stay of trial proceedings below denied), *cert. denied*, 377 U.S. 952 (1964); 363 F.2d 87 (4th Cir.) (motion for writ of mandamus to compel transfer of proceedings below denied), *cert. denied*, 385 U.S. 899 (1966); 373 F.2d 361 (4th Cir.) (in banc) (petition for writ of mandamus to compel transfer granted), *cert. de-*

issued to General Tire, and in the alternative, claiming a royalty-free license. The second was a suit filed in Cleveland, Ohio,[2] by General Tire claiming infringement of its patent by Firestone (as well as by several other tire companies which have now been dismissed). In 1967 the Baltimore case was ordered transferred to the United States District Court in Cleveland and the issues in two cases were consolidated.

The patent in suit (U.S. Letters Patent No. 2,964,083), an oil-extended synthetic rubber composition for use in tires and tire treads, was found valid by Judge Holtzoff[3] in the United States District Court for the D. C. Circuit after issuance of the patent had been denied following extensive consideration by the Patent Office. The patent was issued December 13, 1960. The application for the patent in suit had been filed by General November 7, 1950, and has been in almost constant litigation here and in many other parts of the world for over twenty-four years.

The Issues

The two principal issues in this litigation as we see them are: first, is General Tire Patent No. 2,964,083 valid against Fire-

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nied sub nom. Firestone Tire & Rubber Co. v. *General Tire & Rubber Co.*, 386 U.S. 960 (1967). As a result of the decision in the case cited immediately above, the litigation was transferred to Cleveland, where General had brought suit against Firestone for patent infringement in 1961.

[2] The Cleveland Litigation: *General Tire & Rubber Co.* v. *Firestone Tire & Rubber Co.*, 349 F.Supp. 333 (N.D. Ohio 1972) (motion to dismiss denied); 431 F.2d 1199 (6th Cir. 1970) (motion to dismiss appeal of order on fraud question granted), *cert. denied*, 401 U.S. 975 (1971). *General Tire & Rubber Co.* v. *Firestone Tire & Rubber Co.*, 349 F. Supp. 345 (N.D. Ohio 1972), *amended in part*, 351 F. Supp. 872 (N.D. Ohio 1972). General originally had brought suit against Goodyear, Uniroyal and Goodrich in Cleveland, adding Firestone on April 4, 1961. After the case was transferred from Baltimore, pretrial proceedings were held. All litigable issues in the Baltimore case were consolidated with the Cleveland case, and the Baltimore phase subsequently was dismissed. During the interim period, Goodyear, Uniroyal and Goodrich had settled with General. Firestone remained the only defendant.

[3] The Patent No. 2,964,083 Litigation: *General Tire & Rubber Co.* v. *Watson*, 184 F. Supp. 344 (D.D.C. 1960).

stone's claims of anticipation, obviousness, and indefiniteness? Second, if so, was and is Firestone licensed to use the patent as a nominee of the Reconstruction Finance Corporation of the United States Government for which General was a contract research agent during the period involved in the research and development of this patent?

We answer both questions in the affirmative.

Relevant History

Both issues take us back many years through much poignant American history. The story really begins with Pearl Harbor.

When in December of 1941 the United States suddenly found itself at war, it was equally suddenly cut off from all principal sources of natural rubber. While Germany had already been manufacturing synthetic rubber (by combining the chemicals butadiene and styrene into a compound called "Buna-S"), the rubber industry in the United States until 1942 depended almost entirely upon imported natural rubber. Pearl Harbor made development of a synthetic rubber industry a national military goal of top priority. Congress gave the Reconstruction Finance Corporation authority to take the steps necessary to organize a synthetic rubber industry in the shortest possible time. This was accomplished through an RFC agency, the Rubber Reserve Company, by the building of synthetic rubber plants with government funds, and the signing of contracts between the RFC and the big four of the rubber industry (Goodyear, U. S. Rubber, Goodrich and Firestone), both to manage and operate the synthetic rubber plants and to pool patents and conduct research for the government, the results of which would be shared royalty-free with the government and its "nominees" (i.e. the other rubber companies participating in the research agreements).

General Tire Company was not then a leading producer and was not included in the research agreements, but in 1943 it was tendered and did accept a contract to operate a United States Government synthetic rubber plant in Baytown, Texas.

Synthetic rubber when first produced in quantity in the United States was produced in U. S. Government plants. The government rubber program provided sufficient synthetic rubber for the military needs of the United States in World War II. It eventually provided over 1,000,000 pounds of synthetic rubber per year and even after natural rubber became available at the end of World War II, synthetic rubber continued to dominate the United States rubber industry.

The United States Government's active participation in the production of synthetic rubber continued through the Korean War (1950 to 1953). The synthetic rubber plants were finally sold to private industry in 1955.

The Synthetic Rubber Tire Process

About the only facts upon which these bitterly opposed parties have agreed in these years of litigation and thousands of pages of records is a general description of the synthetic rubber tire-making process and the definition of some of the terms employed extensively in this litigation.

Stipulation as to Process

In this country the synthetic rubber made from butadiene and styrene was first referred to as Buna-S. Under the Government Rubber Reserve program beginning in 1942 the butadiene-styrene copolymer was called GR-S. For a time after 1942 butadiene-styrene synthetic rubbers were referred to in this country by both designations. GR-S was made at 122° F. by a liquid emulsion polymerization process in which so-called "modifiers" were employed to produce rubbers within the Mooney standards established for the GR-S rubber at an early date in the range of 45 to 55 ML-4. In the early 1940's the American processors wanted a rubber which could be handled in the same equipment they had been using for natural rubber.

Firestone became the operator of a government-owned syn-

thetic rubber plant at Lake Charles, Louisiana in 1943. The general procedure followed in the government-owned plants in producing GR-S during World War II was as follows: Liquid butadiene, under pressure, was mixed with a water emulsion of styrene in the proper proportions and in the presence of the necessary chemicals to start and maintain the polymerization reaction and to "modify" the reaction to produce a product of the specified Mooney. • • •

The reaction produced a dispersion (latex) of extremely small rubber particles in water. In most government-owned plants, a salt-acid coagulant was then added to produce a coagulum which was sometimes referred to as crumb. However, in the Firestone operated plants at Akron and Lake Charles aluminum sulfate (having an acidic pH value) was used as the coagulant. The rubber was separated from the water and passed through warm drying ovens where air temperatures were controlled at approximately 180-190° at most government-owned plants, and at 200-220°F. at the Lake Charles Plant. The rubber was then formed into bales of about 75 pounds.

The German Buna-S rubber and the American GR-S rubber commercially produced prior to 1948 were "hot" rubbers. This means the rubber was made at temperatures of around 122°F. (50°C.).

During World War II, experimental work was done in this country and in Germany upon the production of rubber in which the reaction was carried on at temperatures below 122°F. Rubber polymerized at a temperature of about 41°F. is called "cold rubber". Cold rubber was not commercially produced before 1948, although it had been produced in pilot plant scale in 1947. The temperature of 41°F. required refrigeration, since the polymerization reaction produced heat. When properly compounded in a tire tread, cold rubber proved to have a higher abrasion resistance than GR-S hot rubber. Over the period of about 1948-1952, cold rubber superseded hot rubber for use in tire treads.

In processing natural rubber for tire treads before World War II, the machinery at American tire factories normally consisted of Banbury mixers, mills (rolls) and extruders. The basic techniques now used in the tire factories for handling or processing rubber and from it building pneumatic tires were developed prior to World War II. In a typical procedure for processing natural and synthetic rubber, the rubber and carbon black, then oil and possibly some chemicals, but not those which would cause vulcanization, were worked in the Banbury until thoroughly mixed. Banburys resemble a dough mixer in that they have blades which counter-rotate within a closed housing. The resulting product was called a masterbatch (a masterbatch rubber being rubbery polymer plus one or more but less than all compounding materials). The masterbatch upon removal from the Banbury was set aside to cool. The masterbatch was passed to a second Banbury, where the remaining ingredients were added and mixed in to form the final stock; these ingredients included the sulfur and vulcanizing chemicals, and in some instances additional softening oil to facilitate processing. The temperatures in the second Banbury were considerably lower than in the first Banbury in order to avoid premature vulcanization which could occur after the sulfur was added. The stock was cooled after removal from the second Banbury. The cooled final stock from the second Banbury was warmed up by working on warm-up rolls before extrusion.

From the warm-up rolls, the final stock, when sufficiently warm, was moved to the extruder. The extruder was a screw fed device provided at its exit end with a die of the proper shape for the extrusion.

Stipulated Definitions

The plasticity of unvulcanized rubber and rubber compounds, both natural and synthetic, can be measured by device known as a Mooney plastometer. The measurement involves rotating a steel disk (the rotor) embedded in

specially prepared rubber specimen which is confined in a cavity surrounding the rotor. The specimen is heated and maintained at a specific temperature, usually 212°F. as the rotor turns at a prescribed speed (2 r.p.m. is standard) for a specified time. The specimen's resistance to the rotation of the rotor is measured and shown on a dial as "Mooney" units. The dial is usually read at four minutes after a warm-up period of one minute. There are two sizes of rotors varying in diameter. One is referred to as large rotor and the other as small. The readings are normally expressed as ML-4 meaning Mooney, large rotor at four minutes after warm-up or MS-4 meaning Mooney, small rotor at four minutes after warm-up. If no temperature is stated for a reading, 212°F. is meant unless the context indicates otherwise. The Mooney plastometer came into use in respect to synthetic rubber in this country about 1942-1943. It is named after its designer, Mr. Melvin Mooney.

• • •

Natural rubber may have a Mooney as high as 110-120 ML-4. Natural rubber when worked by itself on a mill or in a Banbury breaks down readily to a lower Mooney.

Neither natural rubber nor any synthetic rubber is useful in a tire unless it is mixed with other materials to form a vulcanizable compound. These materials include carbon black and various chemicals added in small proportions for the purpose of obtaining proper vulcanization and for preventing oxidation. Sulfur is the most common vulcanizing agent, and other chemicals are used to accelerate the vulcanizing reaction. Tire tread recipes include some softeners.

Carbon blacks employed in tires and particularly tire treads are known as reinforcing blacks. The degree of reinforcement depends upon the particle surface area and the structure of the carbon black. Before 1940 the best available carbon blacks were the channel blacks, which in essence were lampblacks made by burning natural gas with less than sufficient air for complete oxidation, in close proximity to a cold

metal channel (I-beam) upon which the black was deposited. One useful type of channel black was referred to as EPC (easy processing channel). During World War II, furnace blacks appeared which were made by cracking natural gas in a furnace. The furnace blacks had about the same particle size as the channel blacks but had a different particle structure, were alkaline instead of acid and were not as easy to incorporate in rubber as the EPC blacks, but gave considerably higher abrasion resistance to the ultimate rubber product. • • • The amount of carbon black required to give the desired reinforcement and working properties of the rubber compounds varies with the type of carbon black employed and the desired physical properties of the vulcanizate. • • • With natural rubber, about 50 parts carbon black were employed for 100 parts rubber in tread stocks, and a similar ratio was used with synthetic rubber.

Tensile strength of rubber is measured by the force required to produce rupture by longitudinally stretching a specimen, stated in pounds per square inch in this country and kilograms per square centimeter abroad, based on the cross-sectional area of the unstretched specimen.

• • •

"Heat build-up" (sometimes called "hysteresis" in this industry) is an important quality of a rubber intended for use in a tire. The lower the heat build-up, the better the rubber for tire treads, other things being equal. When rubber is deformed, it generates heat. Various methods of measuring heat build-up are employed, all of them involving repeated deformation of the rubber.

Important Definitions

Of great importance in this appeal are three terms: polymer, masterbatch and compound.

Polymer is defined by Webster as "a natural or synthetic chemical compound or mixture of compounds formed by polymerization and consisting essentially of repeating structural units." Webster's Third New International Dictionary of the

sh Language Unabridged 1759 (Merriam-Webster ed.). Polymerization is a chemical reaction in which small cules (here molecules of butadiene and styrene) com- to form long chain molecules.

asterbatch – Webster defines this word as "a mixture that ists of rubber . . . with one or more compounding ingredi- in definite proportions but higher concentrations than in rmal mix and that is used for convenience in compound- " *Id.* at 1390. In the preceding stipulation the parties ed that a masterbatch was "rubbery polymer, plus one or e, but less than all compounding materials." The stipula- also described what materials did and what did not go the masterbatch:

> In a typical procedure for processing natural and synthetic rubber, the rubber and carbon black, then oil and possibly some chemicals, but not those which would cause vulcanization, were worked in the Banbury until thoroughly mixed. Banburys resemble a dough mixer in that they have blades which counter-rotate within a closed housing. The resulting product was called a masterbatch.

Compound is defined by Webster: 1. A chemically distinct stance formed by union of two or more ingredients (as nents) in definite proportion by weight and with definite ctural arrangement." *Id.* at 466. As used in this case "com- nd" appears clearly to be the final stock (after addition vulcanizing ingredients) as it is mixed and rolled before ng extruded as a tire tread.

Validity of the Patent in Suit

The initial court decision in this lengthy litigation over- ed the Patent Office and held that General was entitled to ance of this patent. Judge Holtzoff thus described the ention:

> The invention lies in the field of synthetic rubber. The specific invention claimed is an article of manufacture.

It is tough rubber to which a large amount of oil is added in the course of manufacture, with the result that the same amount of raw material produces a much larger amount of the finished product than theretofore, and also that the rubber so produced has superior qualities, especially for use as tire treads. It is known in the trade as "oil extended rubber". In their application for the patent, the inventors state:

> "We have found that the tough rubbers which were considered unprocessible and not suitable for making extruded tire treads in production may be mixed with relatively large amounts of one or more compatible oils or plasticizers to provide compounds of exceptional quality."

General Tire & Rubber Co. v. *Watson*, 184 F. Supp. 344, 346 (D.D.C. 1960).

The patent itself is attached to this opinion as Appendix A. But some idea of its purpose may be derived from the first portion of the patent:

2,964,083

PNEUMATIC TIRES AND TREAD STOCK COMPOSITION

Emert S. Pfau, Gilbert H. Swart and Kermit V. Weinstock, Akron, Ohio, assignors, by mesne assignments, to The General Tire & Rubber Company, Akron, Ohio, a corporation of Ohio

Filed Nov. 20, 1950, Ser. No. 196,584

22 Claims. (Cl. 152–330)

The present invention relates to the manufacture of pneumatic tires of the type suitable for use on various types of motor vehicles, airplanes and the like. It particularly relates to pneumatic types having extruded tread portions of an exceedingly tough synthetic rubber.

It is an object of the present invention to provide an xtruded tread for pneumatic tires which tread has im-roved properties combined with lower cost than those ieretofore produced.

It is another object of the present invention to provide mass of a rubber compound which does not stiffen n the coldest climates or which has clearly improved lexibility at low temperature combined with good abra-ion and has other desirable physical properties.

It is a further object of the present invention to provide pneumatic tires having properties superior to those presently prepared which can be produced in vol-ume utilizing the usual rubber machinery and which use less rubbery polymer.

Other objects will be apparent from the following description of the invention.

Only a few types or a few varieties of the many various types of synthetic rubber have been considered suitable for the manufacture of tires and in particular the treads of tires. This is because the rubber characteristics or qualities for tire treads are exacting and difficult to meet. Tire treads must be of uniform weight and cross-section; they must wear well and resist cracking both due to flexing and light; they must have substantial tensile strength and toughness. These qualities are had only in rubber compounds of the highest quality. Only highest quality rubber compounds are therefore used for good tires whereas in mechanical goods and especially in rubber footwear cost per unit of compound weight and not quality is the controlling factor.

Even though quality is of prime importance in tires, it is essential that tires be capable of being made in volume and to make tires in volume it is necessary that the rubber compounds used be capable of extrusion through an orifice (including calendering which is, in fact, extrusion through a die having rotating sides). It is only by such extrusion processes that tire treads have been made in volume and with uniformity.

Naturally, the rubber must be rendered sufficiently plastic for extrusion by apparatus of a rubber factory. Synthetic rubbers may be produced in a relatively tough state or in a relatively more plastic state as desired by simply regulating the percent of modifier. For example, a long chain mercaptan may be present in the mixture and the polymerization stopped at a point where the desired rubber is obtained. Larger amounts of mercaptan and lower degrees of conversion give more plastic synthetic rubbers with less cross-linking or gell formation.

Tough rubbers have always been broken down by long mastication or heat softening to a plastic or extrudable state before they are used in preparing tires for sale. This even though it has long been known that by an expensive and inefficient press molding operation (as distinguished from extrusion where material is forced through an orifice) a tread or at least a portion of a tread may be made without such breakdown or molecular degradation necessary for extrusion and that treads of such non-broken down rubber have a much higher abrasion resistance than those of the broken down rubbers.

The earliest synthetic rubbers were made before the discovery of the effects of mercaptan and other modifiers and were therefore so tough that they could not be processed in the ordinary factory mill without extensive plasticization. Plasticization may be and was generally accomplished by extensive mastication and/or heat softening to cause degradation or break-up of the molecules of the rubber. After this molecular degradation was had, plasticizers usually in amounts of 15 percent or less were added to the rubber to further reduce plasticity.

Inasmuch as the use of plasticizers or softeners in rubber compounds has been shown to be undesirable and to result in marked deterioration in physical properties, the use of appreciable amounts of liquid plasticizers in rubber compounds of the quality required for pneumatic tires was not even considered or if considered, was never

ound to be useful. This reasoning was applied even to ertain mechanical goods where quality was important. In ire treads the maximum amount of softener tolerable as been about 15 percent based on the weight of the ubber and only 5 to 10 percent is usually used. Very ecent work has been directed to the softening of these ougher synthetic rubbers so that they can be used in a actory. The process used is to force air into the Banbury to accelerate deterioration of the polymer. We are naware of any advantage in the process as the polymer s so deteriorated. Work has also been done to deeriorate or breakdown latex of tough rubbers in a vain ttempt to utilize the advantage inherent therein.

With the discovery of the effect of modifiers and aliphatic mercaptans which permitted the production of more plastic rubbers of the general purpose type, synthetic rubbers suitable for tires were produced directly in the plastic stage where they could be processed in the factory with little, if any, premastication. The general trend is now toward even more plastic rubbers. This trend and this procedure was adopted even though as above indicated it has long been recognized that the tough rubbers when carefully processed and broken-down to a very limited extent provided superior tire treads than the softer rubber. It was reasoned and generally believed that inasmuch as the rubber necessarily had to be plasticized or broken-down for factory processing that one might, just as well start with a highly modified or soft rubber in the first instance and obtain the same end product.

We have found that the tough rubbers which were considered unprocessable and not suitable for making extruded tire treads in production may be mixed with relatively large amounts of one or more compatible oils or plasticizers to provide compounds of exceptional quality. Such compounds containing large amounts of softener have produced tire treads superior to those produced with the general purpose GR-S rubbers heretofore available and at very much reduced cost. The softener is

incorporated, in accordance with the present invention, in the rubber before the rubber is deteriorated by mastication and preferably while the rubber is in a finely divided state such as is present in aqueous dispersions or in a crumblike state with small particles which may be separated by a pigment such as carbon black. Mastication in the presence of large amounts of softener added in the stages of the mastication procedure prevents the breakdown of the rubber such as is had by the usual masticating procedures.

The process employed is described thus in the patent specification:

In order to obtain maximum advantage from the tough high Mooney rubbers these rubbers should be combined with oil when in the finely divided state so that the oil can enter (be absorbed) between molecules of the rubber to facilitate slippage one on the other before they are ripped apart and broken-up by mastication. If the high Mooney rubbers are obtained in the form of a bale or large mass, they should for best results be pulverized or granulated to a powdery or crumblike state prior to contact with the oil. Such is accomplished without deteriorating the rubber. In contrast to low Mooney rubbers such as standard GR-S (Government Synthetic rubber, a general purpose butadiene-styrene copolymer), the high Mooney rubbers, when masticated in a Banbury mixer, will usually form a pulverant mass because of the lack of plasticity when they are incorporated into a Banbury mixer or the like. Frequently, however, this is not the case. In such cases pulverization of the entire material may be accomplished by adding small amounts of carbon black or other pigment with the rubber before plasticization has occurred so that the rubber particles are insulated from each other and prevented from being packed together as they are formed by the mixing apparatus. When the required amount of oil or other suitable plasticizer is added at the time the material is in a finely subdivided condition it is uniformly absorbed and

best results are obtained. Addition of large proportions of oil used in the practice of the present invention to a large solid mass of rubbery polymer makes it more difficult to produce a homogeneous compound. When the rubbers are in the finely divided state, they are rapidly swelled by the oil without deterioration and the rubber particles thereafter readily agglomerate to form a plastic mass.

By utilizing our preferred procedure factory processable rubber compounds may be made in the very short time commensurate with ordinary procedures based upon the relatively highly modified and easily processable commercial synthetic rubbers. The rubber articles such as tire treads produced from the compounds having large amounts of oil are equal to and in many cases considerably superior in properties to those produced from conventional mixes.

When the rubber is available in the form of a latex, the oil is preferably first emulsified and incorporated in the latex in the emulsified form and the mixture suitably coagulated. Preferably a so-called shock method of coagulation is used wherein the coagulable latex-oil emulsion mixture is passed into a large mass of coagulating medium such as salt and acid. Even unemulsified oil may also be incorporated into the wet coagulum or crumb even in the presence of free drainable water and it is found it will be selectively absorbed even in the presence of such water.

In the compounding of the synthetic rubber-oil mixtures the total quantity of oil plus synthetic rubber is considered to be rubber. By this method compounds formed in accordance with the present invention generally have hardness and physical characteristics similar to normal compounds made from commercial easy processing synthetic rubbers. To illustrate this, a good tread compound having 100 parts of rubber and 50 parts of carbon black generally gives properties which are desirable. Using tough rubber-oil combinations with 100 parts

of rubber and 100 parts of oil, we would utilize 100 parts of the carbon black for about equal hardness and comparable properties.

Typical of the 22 claims of the patent are the following:

A curable rubber tread stock the principal ingredients of which are an aliphatic hydrocarbon compatible synthetic hydrocarbon polymer of a conjugated diolefinic compound of less than 8 carbon atoms, 20 to 100 parts of a compatible plasticizer to 100 parts by weight of said polymer and a high abrasion furnace black in an amount of at least 35% by weight of the combined polymer and plasticizer, said polymer having a Mooney viscosity of at least 100 prior to compounding with said plasticizer and the proportion of plasticizer and carbon black in the composition being that required to produce a tread stock having a Mooney viscosity of from 30 to 70.

A curable rubber tire tread stock comprising essentially a hydrocarbon-oil-compatible, rubbery, synthetic hydrocarbon polymerization product of a conjugated diolefinic compound having not in excess of 8 carbon atoms, which compound has a raw Mooney plasticity of at least 90 (ML-4), a reinforcing carbon black pigment, and at least 30 parts by weight of a compatible plasticizer per 100 parts of said polymerization product, said rubber tread stock containing from 30 to 80 parts by weight of said reinforcing pigment per 100 parts by weight of the combined amount of said polymerization product and said plasticizer present, and said tread stock having a Mooney plasticity (ML-4) not appreciably in excess of 80 and not substantially less than 40.

A curable rubber tire tread stock comprising essentially a hydrocarbon-oil-compatible, rubbery, synthetic hydrocarbon polymerization product of a conjugated diolefinic compound having not in excess of 8 carbon atoms, which has a raw Mooney plasticity of at least 90 (ML-4), a reinforcing carbon black pigment, and a compatible oily plasticizer, there being from 30 to 100 parts by

weight of said oily plasticizer to 100 parts by weight of said polymer and from 30% to 80%, by weight of said carbon black, based on the combined weight of said polymer and said plasticizer present, and said tread stock having a Mooney plasticity (ML-4) not appreciably in excess of 80 and not substantially less than 40.

The District Judge who tried this case made the following ling concerning the problem the inventors were seeking to ve:

> [T]he conventional commercial manufacture of the tread portions of pneumatic tires at the time of the invention of the patent in suit was as follows: Butadiene-styrene rubber with a plasticity of about 50 Mooney was mixed with about 50 parts of carbon black and about 8-12 parts of hydrocarbon oil (both based on 100 parts of rubber) and mixed in a Banbury for a total of about seven minutes, then extruded to form the tread portion of the tire. The equipment, procedures, and times employed were basically the same as those that had been used for processing natural rubber prior to World War II. The use of high Mooney rubber (90 Mooney and above) was avoided because it was too tough to process commercially into a tire tread or tread compound, even though it had been known from the early 1940's that its abrasion-resistant properties were superior. The use of amounts of oil beyond 8-12 parts was also avoided, even though it had been known for years that oil was a softener for rubber, because it was thought that more oil was incompatible with the maintenance of the high physical properties demanded of a tread rubber. It was in the context of this art that the inventors began their work.

The features of this invention emphasized by General are ese:

1. The employment of a polymer of over 90 Mooney in ace of the customary 50 Mooney polymer.
2. The economical increase of the amount of synthetic

rubber for tire tread stock by extension of the polymer by addition of 20 parts or more of oil where previously it was thought that such amounts of oil would degrade the quality of the tire.

3. The addition of the oil when the polymer was in a finely divided state (crumb) so that the oil mixed quickly with the polymer without long mastication which tended to degrade the polymer.

4. The employment in making an oil extended synthetic rubber of the normally used factory machinery without any extension of production time.

5. The development of a synthetic rubber of at least comparable characteristics as to resistance to friction and heat build-up and superior characteristics as to use in frigid climates.

This record makes clear that the novelty claimed lies in the use of high Mooney polymer, in the proportions of oil and carbon black added, and in the method of processing the components rather than in the addition of any new ingredient to the compound.

The patent in this case, as noted above, was granted by Judge Holtzoff's decision thirteen years ago after the same issues (anticipation, obviousness, and indefiniteness) now sought to be raised before us were vigorously litigated. *General Tire & Rubber Co.* v. *Watson*, 184 F. Supp. 344 (D.D.C. 1960). These same issues were subsequently presented to the British courts.[4] The Supreme Court of Judicature – The Court of Appeals – made a thorough, indeed a brilliant, analysis of each of these three issues (albeit on a somewhat different record and legal standards) and affirmed the validity of the patent as determined by the British trial court.[5] We now have before us a judgment of the United

[4] *General Tire & Rubber Co.* v. *Firestone Tyre & Rubber Co., Ltd.*, [1971] R.P.C. 173 (Ch. 1970), *aff'd*, [1972] R.P.C. 457 (C.A. 1971).

[5] The patent in suit has been held to be valid in England. *See* note 4, *supra*. In South Africa a related patent, though viewed as novel, was held as invalid because of the indefiniteness of a term not present in the patent before us. Related patents were held to be invalid in France and Mexico.

tates District Court for the Northern District of Ohio, Eastern)ivision, again affirming the validity of this patent against 'irestone's objections. This judgment has been arrived at after early five years of trial proceedings in two different District Courts. We do not rely too heavily upon either the District udge's opinion or his extensive findings of fact, since they ear the unmistakable stamp of the work product of General Tire's attorneys. But we certainly cannot ignore the fact that he trial judge who heard and reviewed these reams of testiiony resolved the basic issues pertaining to this patent in avor of its validity.

We thus turn an eye, somewhat influenced by the history f this litigation, to examine once again what so many other udges have considered. Stated in other words, this patent omes to us for review with a high presumption of validity. 5 U.S.C. § 282 (1970); *Radio Corp. of America* v. *Radio Engineering Laboratories, Inc.*, 293 U.S. 1, 7 (1934); *Cold Metal Process Co.* v. *Republic Steel Corp.*, 233 F.2d 828, 837 (6th Cir.), *cert. denied*, 352 U.S. 891 (1956); *Midland Steel Products Co.* v. *Clark Equipment Co.*, 174 F.2d 541 (6th Cir.), *cert. denied*, 338 U.S. 892 (1949); *Panduit Corp.* v. *Stahlin Bros. Fibre Works, Inc.*, 298 F. Supp. 435 (W.D. Mich.), *aff'd*, 432 F.2d 272 (6th Cir.), *cert. denied*, 401 U.S. 939 (1969); *United States Plywood Corp.* v. *General Plywood Corp.*, 230 F. Supp. 831, 837 (W.D. Ky. 1964), *aff'd*, 370 F.2d 500 (6th Cir. 1966), *cert. denied*, 389 U.S. 820 (1967).

Firestone's appeal attacks the District Judge's upholding of he validity of this patent. Firestone claims 1) that the patent vas anticipated by the prior art, 2) that the alleged invention vas clearly obvious under Section 103 (35 U.S.C. § 103), and 3) that the claims of the patent are vague and unduly broad, i.e. indefinite.

Anticipation

We understand thoroughly that General's invention was by no means the first attempt to use oil in making synthetic

rubber. The use of oil in small quantities as a plasticizer was standard practice in the synthetic rubber industry. In addition, from time to time there had been efforts to experiment with addition of larger quantities of oil. The British Court of Appeals pointed out accurately, we believe, that the Semperit (a) (Application S153,625) and Semperit (c) (Application No. 157,456) patents (Austrian) relied upon by Firestone did not teach the minimizing of mastication of the polymer and that the Wilmington patent did not teach the use of a high Mooney polymer.[6] Since these features are the essence of General's patent, we agree that these publications do not represent anticipation.

The United States Government's Tire Test Reports 111 and 123 represent a serious challenge to this patent. Yet in the end in our review of these two test, we cannot hold that the District Judge's conclusion that they were "abandoned and taught away from, not toward the invention" was "clearly erroneous." Test Report 123 was the later of the two tests and was in part occasioned by Test Report 111's showing of success with a 97 Mooney tire. The conclusion of Test Report 123, however, was to recommend a polymer of 50 Mooney cold rubber, and commercial production thereafter was based upon 50 Mooney rubber. It is true that these test of polymers with different Mooney ratings and different oil loadings might have revealed the possibilities of success with the employment of a high Mooney polymer and substantial oil extension. Perhaps because of additional processing or perhaps because of the industry's established aversion to oil because of degradation of the rubber, no such result was realized or recommended.

The District Judge's findings which follow are not contradicted by this record and are not clearly erroneous:

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[6] These publications had also been urged upon Judge Holtzoff without success.

165. The conclusion drawn from Tire Test 123, as stated in the final report prepared by Rubber Reserve test fleet and approved by Mr. Greer, the head of research and development for the government and one who had followed the test closely, was that:

> "The outstanding experimental polymer from the standpoint of treadwear was the Cumene-hydroperoxide 50 Mooney rated 21% superior to control GR-S-10 in this respect."

166. The Court finds that the experimental work allegedly involving higher-than-normal viscosity rubbers in Tire Test 123 was abandoned and taught away from, not toward, the invention:

(a) In accordance with the conclusion of the final report on Tire Test 123, 50 Mooney cold rubber went into large scale commercial production thereafter and eventually became the standard rubber for tire treads. In contrast, cold rubber having a Mooney above 65 Mooney was not commercially produced or used for tire treads until after General's invention.

(b) The results of the test itself discouraged further work with high Mooney rubber. It emphasized the 50 Mooney rubber as the outstanding polymer, and it showed that the high Mooney rubbers could not be processed in the ordinary time or manner.

(c) Unfavorable comments on the high Mooney-high oil aspect of the tests were reported by personnel at Phillips.

(d) Unfavorable comments on the high Mooney-high oil compounds were also expressed by Lake Shore personnel. In March, 1951 after General's invention had been announced, an inquiry about the Tire Test 123 work was made of Mr. Roy E. Rude, technical manager at Lake Shore when the tests were made and a major participant in them. He wrote that he was a "low Mooney advocate" and that as a result of Tire Test 123

work, Lake Shore would "not recommend the use or incorporation of over 12 parts of softener." Further, regarding Tire Test 123, he said:

> "We discontinued our experimentation on high Mooney GR-S with high oil to work on cold rubber. The better polymers on cold rubber have shown to be ones with low Mooney but no advantage was seen in the very high Mooney polymers, in particular with the high oil."

(e) Mr. Greer, in trying to determine what General's invention was, considered the high Mooney-high oil work reported in Tire Test 123, but he concluded General's most likely course was with low Mooney rubber and high amounts of carbon black.

Obviousness

Judge Holzoff's pertinent and accurate description of how General happened upon this invention is perhaps as good a way as any to open discussion of this topic:

> We now reach the history of the appellants' invention. The three individual inventors were research chemists or chemical engineers employed in the laboratory of the corporate plaintiff, the General Tire and Rubber Company. Late in 1949, when the industry was searching for additional means to increase the supply of rubber, the three inventors conceived the project of using tough rubber, which had been regarded as useless, for inferior purposes such as rubber mats for automobiles. In order to make this rubber usable for these purposes, they began to mix it with large quantities of oil. They discovered accidentally that instead of merely making it possible to employ for inferior purposes rubber of a type that had been regarded as not usable at all, they were producing a high quality of rubber suitable for tire treads. They found that mixing oil in large quantities of over 20 parts of oil to 100 parts of rubber with very tough rubber, or high Mooney rubber as it was known in the trade, in-

creased the amount of the final product. They not only made it usable, but they improved its quality and found that it was excellent for tire treads.

Thus we have a development that was discovered accidentally by research scientists who were working with an entirely different objective in mind than the one which they finally achieved. This was not an invention, in other words laboriously derived through trial and error or attained by a long process of experimentation. It was one of those unusual situations where a discovery is made or an invention designed accidentally while the inventor or discoverer was in the throes of a somewhat different development.

[3] The present statute emphasizes the proposition that it makes no difference as to patentability by what manner an invention is made. 35 U.S.C. § 103. The fact, however, that the discovery was made accidentally by a person skilled in the art, while others had been working to find other ways and means to achieve the same general objective, namely, to increase the supply of usable rubber, would seem, to some extent at least, to negative the contention that the invention was obvious. This circumstance, of course, is not conclusive, but it is one of the many matters that are worthy of consideration in that connection. *General Tire & Rubber Co.* v. *Watson*, 184 F. Supp. 344, 347 (D.D.C. 1960).

In the British Court of Appeals decision upholding the British patent, the opinion of Lord Justice Sachs pointed significantly to a recognized "gap" in the industry's knowledge concerning tire making:

The plaintiffs in their specification propounded the existence in 1950 of a gap in industrial knowledge which was in the first instance judgment, [1970] F.S.R. at 284,* stated in the following terms:

* [1971] R.P.C. at 222.

> "It was realised that if one could process tough rubbers in such a way as to retain their long molecules and therefore their high abrasion resistance after manufacture, a very good tyre could be produced, but the difficulty apparently was that no one realised how to do it".

The existence in 1950 of that gap was challenged in this court. However, in a well-known publication of Firestone (U.S.A.), the parent company of the first defendants, called "Synthetic Rubber Facts" (Vol. N, page 7), it has, since the date of the patent, been stated:

> "It had been known for some time that high Mooney polymer had superior treadwear resistance, but this property could not be exploited because of the difficulty of processing the polymer".

Moreover, in an internal memorandum (dated 17th January 1951—G.5, 5,071), the Manager of the Research Division of Goodyear, a rival company to the plaintiffs in the U.S.A., also refers to this gap. (That memorandum deals with the researches set in train by the 21st November 1950 (G.10, 10,026) memorandum from the U.S. Office of Rubber Reserve after the plaintiffs had, on 7th November 1950, written (G.5, 5,067) to the latter saying they had made an important discovery—the "22 per cent. more rubber" letter to which further reference will be made.) The Goodyear "Story of the Tire" (G.11, p. 11,248B) contains this passage:

> "The rubber chemist had long believed that tough rubbers possess higher quality than the softer rubber ordinarily used, but there was no feasible way to employ them, because of processing difficulties with conventional rubber factory production equipment".

On that footing the 1950 problem was as to how to process tough polymers in the requisite way so as to provide results which were commercially useful and at the same time economically viable, for which purpose the polymers would have to have the least practicable degree of degradation.

From the evidence taken as a whole – including the two extracts cited – it is manifest that, industrially speaking, a gap as defined by the trial judge existed in 1950 and that it produced the above related problem. It is no less clear that the process set out in the patent-in-suit provided the answer to the problem. Further it is plain, as, indeed, is conceded by the appellants, that immediately after June 1951, (when the plaintiffs publicised it in an issue of "India Rubber World" – G.6, 6,060) that process commenced to be adopted by the tyre manufacturing industry and that in due course it achieved the great commercial success already mentioned. *General Tire & Rubber Co.* v. *Firestone Tyre & Rubber Co., Ltd.*, [1972] R.P.C. 457, 477-78 (C.A. 1971).

While these observations come from a different legal jurisliction and from a different record, we believe their logic o be fully applicable to our case and we adopt it.

One of the ways by which a showing of obviousness may be ebutted is to point to a long-felt and (up to the point of nvention) unfulfilled need. *Graham* v. *John Deere Co.*, 383 U.S. 1, 17-18, 35 (1966); *Inland Mfg. Co.* v. *American Wood Rim Co.*, 14 F.2d 657, 659 (6th Cir. 1926); *American Ball Bearing Co.* v. *Finch*, 239 F. 885, 889 (6th Cir. 1917).

The need was felt in 1950 and General's invention filled it.

Still another (albeit not necessarily controlling) factor tending to rebut obviousness is immediate acceptance of the invention in the art. *United States* v. *Adams*, 383 U.S. 39, 52 (1966); *Forestek Plating & Mfg. Co.* v. *Knapp-Monarch Co.*, 106 F.2d 554, 558 (6th Cir. 1939).

That such acceptance followed General's invention is beyond dispute. Oil extended masterbatches became the standard production item in the Government's synthetic rubber plants. Every major tire company used such masterbatches in compounding their tire treads.

The initial reaction of the industry to General's first announcement that it had a method of producing 22% more rub-

ber was skepticism and scorn. The Government reacted to General's offer to sell its invention for $60,000,000 by efforts to determine what the invention was. In spite of its possession of all of the prior art, including Tire Tests 111 and 123, it completely failed to do so.

The answer probably can be found in the testimony of one of Firestone's witnesses in the High Court of Justice, Chancery Division:

> Q. "Did you find anything technologically surprising in the development, as opposed to economically"?
>
> A. "Yes; I must honestly say that we were surprised that one could use such quantities of oil."
>
> Q. "Such big quantities"?
>
> A. "Yes . . . We had got so accustomed to the oil loadings we had used for many years, that one regarded the levels we were using of 5 or 8 parts as being normal. 45 parts of oil of course seemed, you know, an astonishing amount to use, even if it was a high Mooney rubber."

We conclude that General's patent is valid as against the claim of obviousness.

Vagueness and Undue Breadth

This court's last adventure with a patent case of this magnitude turned on a finding that an immensely valuable patent upon the oxygenation process for making steel was invalid for undue breadth. *See Kaiser Industries Corp.* v. *McLouth Steel Corp.*, 400 F.2d 36 (6th Cir. 1968). There this court concluded that the claims of the patent were so broadly drawn as to levy tribute upon practically any method of employing oxygen to make steel.

We have reviewed the claims of this patent with the *Kaiser* case clearly in mind and find utterly different conclusions. The claims are made applicable to polymers of specific Mooney ratings (not less than 90 and in a nonbroken-down state) combined with hydrocarbon oil and high abrasion carbon black

additions in specifically named parts. The claims are, in our view, reasonably clear to possible infringers and so limited as properly to claim the invention without claiming any and all oil additions to rubber polymers. Hence, we affirm the District Judge's rejection of Firestone's claims of vagueness and undue breadth.[7]

We find no merit to Firestone's appeal concerning infringement.

We affirm the judgment of the District Court holding General Tire's Patent No. 2,964,083 to be valid and infringed.

The Research Contract, The General Tire Patent No. 2,964,083 and Their Relationship

The decision just announced above may, however, prove to be of relatively little value to General. For as we indicated at the outset, we also hold that General is obligated by the explicit terms of its Research Contract with the Reconstruction Finance Corporation to give a royalty-free license to practice this invention to the RFC and its nominees, of which Firestone is clearly one.

---

[7] Although the issue is not squarely raised by Firestone's appeal, we have sua sponte given much thought to whether the first 12 of the claims of the patent in suit are void for undue breadth in a totally different sense. These claims all begin:

"What we claim is:
"A pneumatic tire having a tread portion comprising a vulcanized synthetic rubber compound containing, etc."

The invention involved herein is, of course, not a tire at all. It is as the later claims describe it "a curable rubber tire tread stock." The invention does not describe a single feature of a tire except General's newly formulated synthetic rubber tread stock. There is no dispute but that this stock is extruded through dies and processes old in the art and attached to the tire carcass, stitched and vulcanized in processes and machinery also old in the art.

In the end we have concluded that the language of these claims immediately following the words "a pneumatic tire" is so restrictive as to require them to be read to claim "a tread portion [of a pneumatic tire] comprising a vulcanized synthetic rubber compound containing, etc." Under this reading we find no occasion to enter a holding of invalidity.

In 1949 RFC and General entered negotiations upon a research contract. The contract was signed on January 17, 1950, but it was dated January 1, 1949, and contained provisions for reimbursement of General for research performed during the whole year of 1949. General billed and was paid by RFC for research during the last half of 1949. The scope of the research work was "rubber-like polymers" excluding a particular General Tire Patent No. 2,441,090, but including "carbon black masterbatches."

In June of 1949 General first began experimenting with adding substantial amounts of oil to high Mooney rubber. General never disclosed any information concerning its work on oil extended rubber to the Government. As will be shown below, General's experiments progressed until November 7, 1950, when General first announced its invention of an oil extended rubber, following which it filed its patent application on November 20, 1950.

The interrelationship in time sequence between key events pertaining to the research contract and to the patent is set forth below:

January 1, 1949:	Effective date of the Research Contract.
June 1949:	General researchers for the first time add oil and carbon black to high Mooney rubber.
August 15, 1949:	General establishes a special project, "Special Low Cost Wet Masterbatch for Tractor Treads and Second Line Passenger Treads."
September-October 1949:	Evaluation of various masterbatches of oil, carbon black, and rubber
January 17, 1950:	Research Contract signed.

January 24, 1950:	Due to the success of the evaluation tests, General upgrades the project to test the treads for premium line tires.
January 1950:	Entire output at the Baytown plant, now operated by General, is in carbon black masterbatches.
March 22-May 8, 1950:	Tire tests conducted by General on the experimental tires geared for premium, not secondary, line tires.
November 7, 1950:	General's public announcement of the invention and statement that tests showed that treads made according to the invention were better than conventional tires.
November 20, 1950:	Patent application filed by General.
January-February 1951:	Government work undertaken which attempted to discover General's invention.
June, July, August 1951:	*India Rubber World* articles concerning invention.
Fall 1951:	General begins making and conducting developmental work on oil masterbatches at Baytown, at the Government's request.

The Research Contract is printed in full with this opinion as Appendix B, but the portions of it which we deem critical to decision follow:

> WHEREAS, the Operating Agreement provides for the reimbursement by RFC to Contractor of the cost of conducting research, experimental, laboratory, developmental, and pilot plant work to the extent approved in advance by RFC in accordance with arrangements to be mutually

satisfactory to RFC and Contractor (all such work being hereinafter referred to as "Research Work"); and

WHEREAS, it is deemed desirable that an arrangement be made between RFC and Contractor relative to patent and other rights which may result from the conduct of the Research Work authorized hereunder;

• • •

3. The applied and developmental Research Work to be conducted hereunder shall be directed to the determination of generally accepted principles for, and to the adaptation of such principles to techniques for, the production of rubber-like polymers of butadiene, and of rubber-like copolymers, mixed polymers and interpolymers of butadiene with styrene; the content of butadiene being within the range of 50% to 100% by weight of the rubber hydrocarbon present. The scope as above indicated excludes any work under or related to Contractor's "wet smear" invention, covered by Patent No. 2,441,-090, but includes carbon black masterbatches and may be further extended by mutual agreement in specific instances.

4. Contractor shall prepare and submit to RFC monthly progress reports and final reports covering in detail all work done hereunder. Said monthly reports shall be submitted not later than the fifteenth day of each following month, and in addition said final reports shall be prepared and submitted promptly upon completion of each distinct subdivision of the work. In addition to said reports, Contractor shall send a representative, well informed in the research provided for, to such meetings as RFC may call.

5. Contractor shall also promptly report and make fully available to RFC or its nominees all information within the scope, as defined in paragraph 3 above, of the research conducted for RFC hereunder (whether patented, patentable, or unpatentable,

and irrespective of whether resulting from work reimbursed by RFC) developed or acquired from any source during the term of this contract by Contractor or its Subsidiaries and Affiliates (Companies in which Contractor now has or may in the future acquire, directly or indirectly, fifty per cent (50%) or more of the stock having the right to vote for directors).

6. In addition to the information submitted under paragraphs 4 and 5 above, Contractor shall disclose and make available to RFC or its nominees, to the extent and whenever requested, all information in the possession of Contractor or its Subsidiaries and Affiliates during the term of this contract, which is outside the scope of the research conducted for RFC hereunder, but which is necessary in connection with the utilization of the information so submitted in the production or use of rubber-like polymers, copolymers, mixed polymers and interpolymers of the composition defined in paragraph 3 above; whether or not any of such information results from work, the cost of which is reimbursed by RFC, or whether it is patented, patentable or unpatentable; but such additional information specifically shall exclude that pertaining to subsequent compounding of synthetic rubber, its latices and masterbatches, or pertaining to the preparation of butadiene, styriene, isoprene, vinyl monomers, and of other raw materials, or pertaining to the preparation of accelerators, antioxidants, catalysts, extenders, plasticizers, carbon or lamp black, and of any other agents for use in the aforesaid production or use.

7. Contractor hereby grants to RFC and its nominees (1) a royalty-free license to utilize without limitation any information or invention (whether or not patented) resulting from the research authorized by this contract, including the right to reproduce, disclose to others, and publish all such information or inventions, and including the right to make, use and

> sell thereunder, and (2) a royalty-free license to use any information or invention to which RFC or its nominees are entitled under the provisions of paragraph 5 above, including the right to reproduce, disclose to others, and publish all such information or inventions, but limited to the utilization of the same in the production, use or sale of general purpose synthetic rubber suitable for use in the manufacture of transportation items such as tires or camel-back, and (3) a royalty-free license with respect to any information or invention made available under the provisions of paragraph 6 above, limited to the utilization of the same in the manufacture, use or sale of rubberlike polymers, copolymers, mixed polymers and interpolymers of the compositions defined in paragraph 3 above.

It thus appears that the Research Contract provided for a general scope of work set forth in paragraph 3, and a requirement of prior authorization by the government as to work on which reimbursement was sought. The contract also required: 1) General's disclosure to the government and its nominees of any information within the scope of the work as set forth in paragraph 3 resulting from General's authorized research work (¶ 4 & ¶ 7(1)). 2) General's disclosure to the government and its nominees of any information within the scope of work, regardless of whether or not it was derived from reimbursed research (¶ 5). 3) General's disclosure to RFC and its nominees of any information in the possession of General outside the scope of the research contract but which is necessary in the use of information submitted in the production of rubber-like polymers but excluding information pertaining to subsequent compounding of synthetic rubber.

We believe that General's invention was exactly the sort of research and developmental work which was contemplated by the contract. The scope paragraph (¶ 3), says clearly:

> "The scope as above indicated excludes any work under or related to Contractor's 'wet smear' invention, covered

by Patent No. 2,441,090, but includes carbon black masterbatches and may be further extended by mutual agreement in specific instances."

As we have noted, the parties to this litigation have stipulated as to the meaning of "masterbatch":

"(A masterbatch rubber being rubbery polymer plus one or more but less than all compounding materials)."

Further, it is beyond dispute from this record that this invention is practiced commercially in the very synthetic rubber plants which the government built and as to one which it hired General first as operator-manager and then as research agent.

In addition, it is clear that General claims that its patent applies when the invention is practiced in synthetic rubber plants.

We hold that General's invention was within the scope of the Research Contract as set forth in paragraph 3.

We emphasize that our decision upon this Research Contract issue is based upon the explicit and unambiguous language of the contract itself, particularly that of paragraph 3 quoted above, and paragraphs 5 and 7(2) below:

> 5. Contractor shall also promptly report and make fully available to RFC or its nominees all information within the scope, as defined in paragraph 3 above, of the research conducted for RFC hereunder (whether patented, patentable, or unpatentable, and irrespective of whether resulting from work reimbursed by RFC) developed or acquired from any source during the term of this contract by Contractor or its Subsidiaries and Affiliates (Companies in which Contractor now has or may in the future acquire, directly or indirectly, fifty per cent (50%) or more of the stock having the right to vote for directors).
>
> • • •

> 7. Contractor hereby grants to RFC and its nominees • • • (2) a royalty-free license to use any information or invention to which RFC or its nominees are entitled under the provisions of paragraph 5 above, including the right to reproduce, disclose to others, and publish all such information or inventions, but limited to the utilization of the same in the production, use or sale of general purpose synthetic rubber suitable for use in the manufacture of transportation items such as tires or camel-back, ...

We can only construe paragraph 5 as requiring disclosure of the invention ("irrespective of whether resulting from work reimbursed by RFC") to RFC and to Firestone as an RFC nominee.

Similarly the plain language of paragraph 7(2) constitutes a grant from General of a royalty-free license to RFC and Firestone as RFC's nominee to use General's invention "in the production, use or sale of general purpose synthetic rubber suitable for use in the manufacture of transportation items such as tires." General's invention clearly was a "general purpose synthetic rubber suitable for use . . . in tires . . . ."

We are, of course, in as good a position to construe the actual contract language as was the District Judge. We find no ambiguity in this contract, and as written and executed, it is complete. The District Judge's holding that the contract was ambiguous and required extrinsic evidence for proper interpretation we believe to be erroneous as a matter of law.

We also hold that the District Judge's interpretation of the contract requiring Firestone to prove that General's invention was derived from reimbursed work was erroneous as a matter of law. To hold otherwise would require us simply to excise from the contract the whole of paragraph 5 and sub-paragraph 7(2).

There are many astonishing interpretations of this Research Contract contained in the findings of fact prepared by General Tire's attorney and adopted by the District Judge. To the degree that they purport to be construction of the con

fact itself and are in conflict with the holdings above, we deem them to be errors of law. To the degree that these findings are based upon extrinsic evidence, we hold as a matter of law that such evidence was not competent to vary the terms of this unambiguous contract. *Local 783, Allied Industrial Workers* v. *General Electric Co.*, 471 F.2d 751, 757 (6th Cir. 1973); *Gesing* v. *Grand Rapids Hardware Co.*, 362 F.2d 363, 366 (6th Cir. 1966); *Calderon* v. *Atlas Steamship Co.*, 170 U.S. 272, 280 (1898). *See* 3 A. CORBIN, CONTRACTS § 573 *et seq.* (1951); 9 J. WIGMORE, EVIDENCE § 2400 *et seq.* (3d ed. 1940).

We recognize the trend toward liberality in the admission of oral evidence concerning the negotiations which led to the execution of a contract. RESTATEMENT OF CONTRACTS, § 235 (d), for example, states, "All circumstances accompanying the transaction may be taken into consideration. . . ."

See also 3 A. CORBIN, CONTRACTS § 579, at 414-20 (1960); 9 J. WIGMORE, EVIDENCE § 2430, at 98-99 (3d ed. 1940); *Airborne Freight Corp.* v. *McPherson*, 427 F.2d 1283 (9th Cir. 1970); *Pacific Gas & Electric Co.* v. *C. W. Thomas Drayage & R. Co.*, 69 Cal.2d 33, 442 P.2d 641 (1968). Although we view the District Judge's admission of extrinsic evidence to have been favorably inclined toward General Tire, we do not find it necessary to pass on every ruling he made excluding extrinsic evidence proffered by Firestone. General Tire's evidence did not in our view serve to alter the conclusion (stated above) that this contract as executed was complete and unambiguous, and hence not subject to interpretation by parol evidence.

The Fraud Charges

Much of this record consists of charges of fraud and bad faith brought by General against Firestone, particularly in connection with Firestone's prosecution of the Baltimore case and by Firestone against General in connection with General's

assignment of the patent in suit to its wholly-owned subsidiary Pneuss of Brazil.

The judge who heard the Baltimore case entered findings contrary to General's charge that Firestone fraudulently created diversity jurisdiction by undertaking to carry the costs of litigation of its co-plaintiff, McCreary Rubber Co. Nor did the Fourth Circuit enter any findings of fraud when it ordered the transfer of the Baltimore case to Cleveland. Under these circumstances we think that the District Judge in the United States District Court in Cleveland, before whom the alleged fraud was not practiced, should not have proceeded to determine such charges.

As to General's assignment of the patent in suit to Pneuss, this in our view represents only one of many evasive measures indulged in by General to escape the effect of its obligations under the Research Contract which it had signed. No findings adverse to General in this or other issues have been entered by the District Court, and we have no inclination to remand any part of this altogether too lengthy litigation for any further proceedings of any kind. Neither party to this litigation has reached this point with the clean hands required for extraordinary equitable relief.

The judgment of the District Court, dated October 3, 1972, is affirmed as to paragraphs 1, 2, 3 and 4.

The judgment of the District Court, paragraph 5, is reversed and it is held that Firestone as a nominee of the Reconstruction Finance Corporation has a royalty-free right to practice and use the patent in suit.

Paragraphs 6, 7, 8, 9 and 10 are vacated.

The judgment of the District Court finding Firestone guilty of fraud in the Baltimore case is vacated.

Since neither party prevailed in the entirety, each will pay its own costs and attorney fees.

Dec. 13, 1960 E. S. PFAU ET AL 2,964,083
PNEUMATIC TIRES AND TREAD STOCK COMPOSITION
Filed Nov. 20, 1950 3 Sheets-Sheet 1

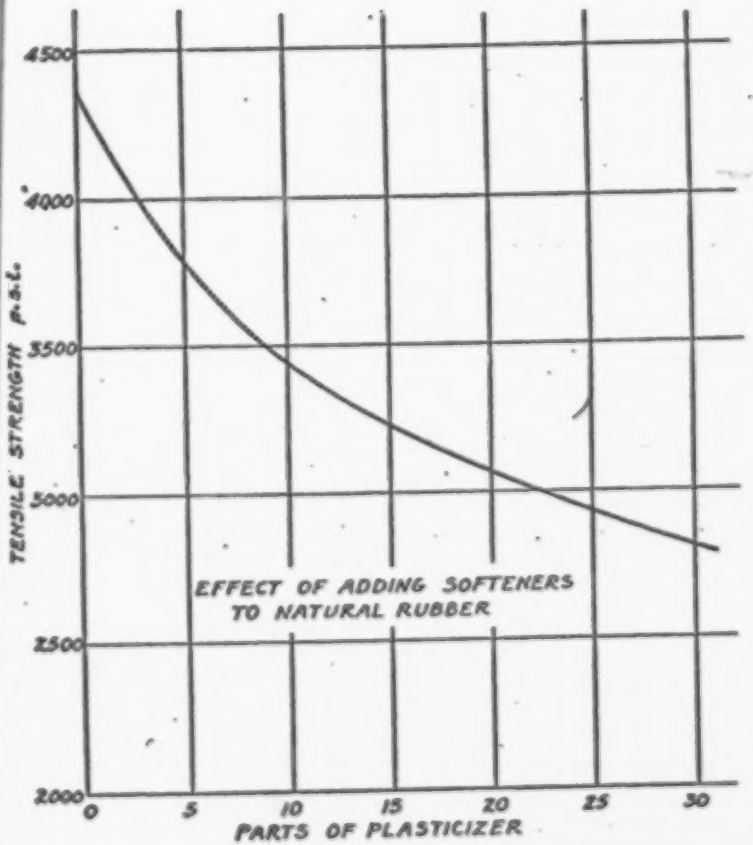

Fig. 1

INVENTORS
Emart S. Pfau
Gilbert H. Swart
Kermit V. Weinstock
BY Cushman, Darby & Cushman
ATTORNEYS

Dec. 13, 1960 E. S. PFAU ET AL 2,964,083

PNEUMATIC TIRES AND TREAD STOCK COMPOSITION

Filed Nov. 20, 1950 3 Sheets-Sheet 2

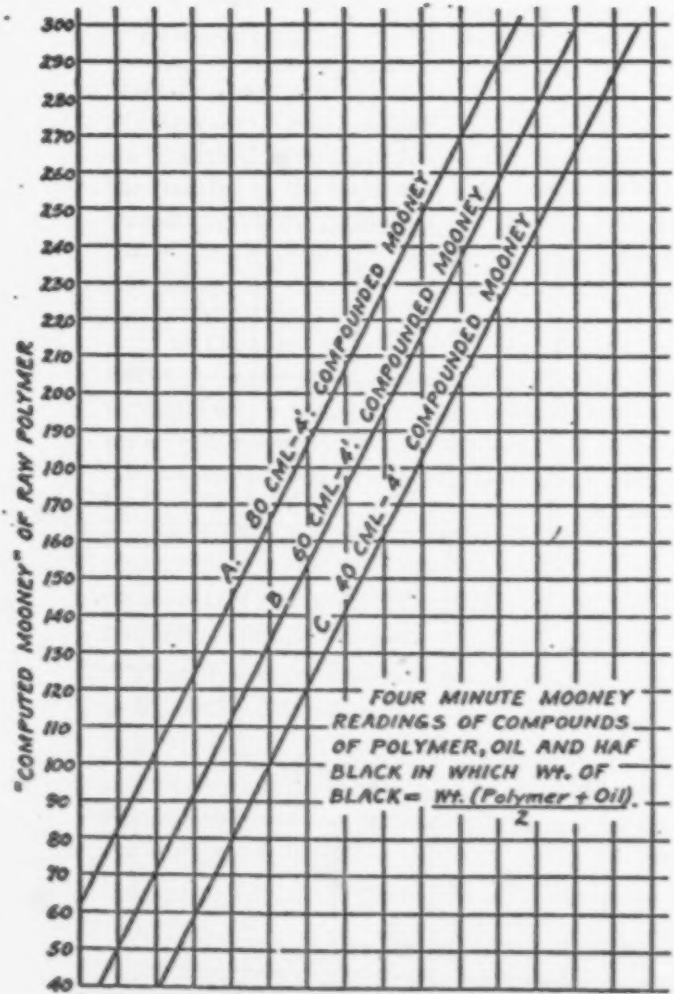

Fig. 2

INVENTORS
Emert S. Pfau
Gilbert H. Swart
Kermit V. Weinstock
BY Evans & McCoy
ATTORNEYS

Dec. 13, 1960 E. S. PFAU ET AL 2,964,083

PNEUMATIC TIRES AND TREAD STOCK COMPOSITION

Filed Nov. 20, 1950 3 Sheets-Sheet 3

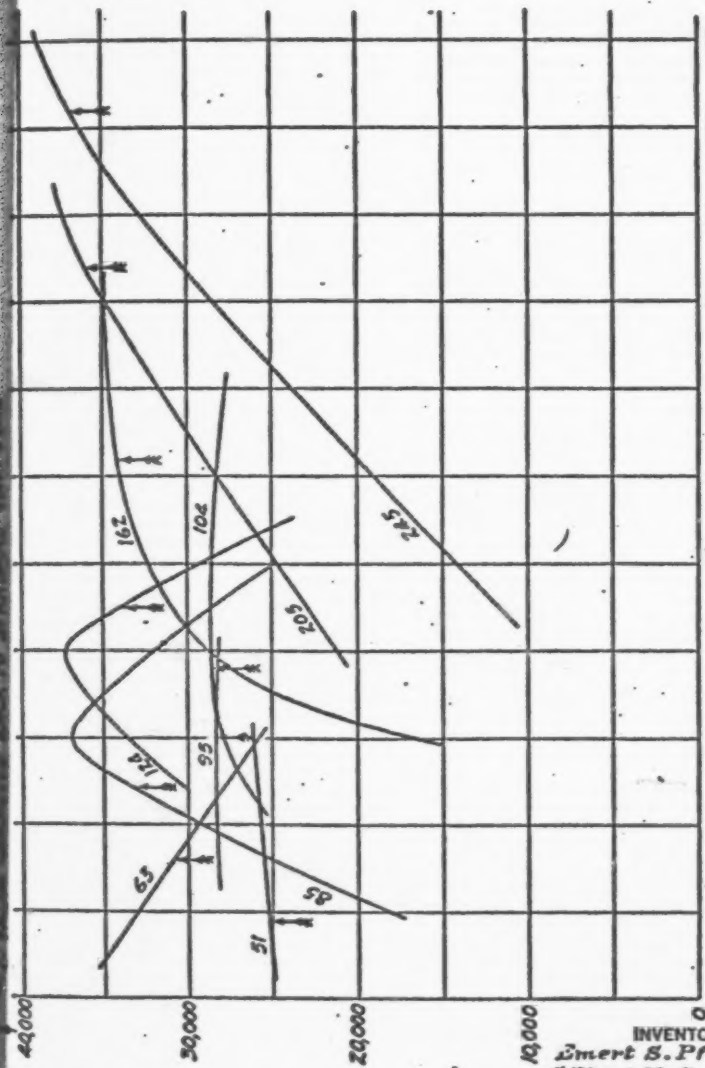

Fig. 3

INVENTORS
Emert S. Pfau
Gilbert H. Swart
Kermit V. Weinstock
BY Evans & McCoy
ATTORNEYS

United States Patent Office

2,964,[illegible]

Patented Dec. 13, 19[illegible]

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2,964,083

PNEUMATIC TIRES AND TREAD STOCK COMPOSITION

Ernest S. Pfau, Gilbert H. Swart and Kermit V. Weinstock, Akron, Ohio, assignors, by mesne assignments, to The General Tire & Rubber Company, Akron, Ohio, a corporation of Ohio

Filed Nov. 20, 1950, Ser. No. 196,584

22 Claims. (Cl. 152—330)

The present invention relates to the manufacture of pneumatic tires of the type suitable for use on various types of motor vehicles, airplanes and the like. It particularly relates to pneumatic types having extruded tread portions of an exceedingly tough synthetic rubber.

It is an object of the present invention to provide an extruded tread for pneumatic tires which tread has improved properties combined with lower cost than those heretofore produced.

It is another object of the present invention to provide a mass of a rubber compound which does not stiffen in the coldest climates or which has clearly improved flexibility at low temperature combined with good abrasion and has other desirable physical properties.

It is a further object of the present invention to provide pneumatic tires having properties superior to those presently prepared which can be produced in volume utilizing the usual rubber machinery and which use less rubbery polymer.

Other objects will be apparent from the following description of the invention.

Only a few types or a few varieties of the many various types of synthetic rubber have been considered suitable for the manufacture of tires and in particular the treads of tires. This is because the rubber characteristics or qualities for tire treads are exacting and difficult to meet. Tire treads must be of uniform weight and cross-section; they must wear well and resist cracking both due to flexing and light; they must have substantial tensile strength and toughness. These qualities are had only in rubber compounds of the highest quality. Only highest quality rubber compounds are therefore used for good tires whereas in mechanical goods and especially in rubber footwear cost per unit of compound weight and not quality is the controlling factor.

Even though quality is of prime importance in tires, it is essential that tires be capable of being made in volume and to make tires in volume it is necessary that the rubber compounds used be capable of extrusion through an orifice (including calendering which is, in fact, extrusion through a die having rotating sides). It is only by such extrusion processes that tire treads have been made in volume and with uniformity.

Naturally, the rubber must be rendered sufficiently plastic for extrusion by apparatus of a rubber factory. Synthetic rubbers may be produced in a relatively tough state or in a relatively more plastic state as desired by simply regulating the percent of modifier. For example, a long chain mercaptan may be present in the mixture and the polymerization stopped at a point where the desired rubber is obtained. Larger amounts of mercaptan and lower degrees of conversion give more plastic synthetic rubbers with less cross-linking or gell formation.

Tough rubbers have always been broken down by long mastication or heat softening to a plastic or extrudable state before they are used in preparing tires for sale. This even though it has long been known that by

2

an expensive and inefficient press molding operation [illegible] distinguished from extrusion where material is forced through an orifice) a tread or at least a portion of a tread may be made without such breakdown or molecular degradation necessary for extrusion and that treads of such non-broken down rubber have a much higher abrasion resistance than those of the broken down rubber.

The earliest synthetic rubbers were made before the discovery of the effects of mercaptan and other modifiers and were therefore so tough that they could not be processed in the ordinary factory mill without extreme plasticization. Plasticization may be and was generally accomplished by extensive mastication and/or heat softening to cause degradation or break-up of the molecules of the rubber. After this molecular degradation was had, plasticizers usually in amounts of 15 percent or less were added to the rubber to further reduce plasticity.

Inasmuch as the use of plasticizers or softeners in rubber compounds has been shown to be undesirable as to result in marked deterioration in physical properties the use of appreciable amounts of liquid plasticizers in rubber compounds of the quality required for pneumatic tires was not even considered or if considered, was never found to be useful. This reasoning was applied even to certain mechanical goods where quality was important. In tire treads the maximum amount of softener tolerated has been about 15 percent based on the weight of the rubber and only 5 to 10 percent is usually used. Very recent work has been directed to the softening of these tougher synthetic rubbers so that they can be used in the factory. The process used is to force air into the Banbury to accelerate deterioration of the polymer. We are unaware of any advantage in the process as the polymer is so deteriorated. Work has also been done to deteriorate or breakdown latex of tough rubbers in a vain attempt to utilize the advantage inherent therein.

With the discovery of the effect of modifiers and aliphatic mercaptans which permitted the production of more plastic rubbers of the general purpose type, synthetic rubbers suitable for tires were produced directly in the plastic stage where they could be processed in the factory with little, if any, premastication. The general trend is now toward even more plastic rubbers. This trend and this procedure was adopted even though as above indicated it has long been recognized that the tough rubbers when carefully processed and broken down to a very limited extent provided superior tire treads than the softer rubber. It was reasoned and generally believed that inasmuch as the rubber necessarily had to be plasticized or broken-down for factory processing that one might just as well start with a highly modified or soft rubber in the first instance and obtain the same end product.

We have found that the tough rubbers which were considered unprocessable and not suitable for making extruded tire treads in production may be mixed with relatively large amounts of one or more compatible oils or plasticizers to provide compounds of exceptional quality. Such compounds containing large amounts of softener have produced tire treads superior to those produced with the general purpose GR-S rubbers heretofore available and at very much reduced cost. The softener is incorporated, in accordance with the present invention, in the rubber before the rubber is deteriorated by mastication and preferably while the rubber is in a finely divided state such as is present in aqueous dispersions or in a crumb-like state with small particles which may be separated by a pigment such as carbon black. Mastication in the presence of large amounts of softener added in the stages of the mastication procedure prevents the breakdown of the rubber such as is had by the usual masticating procedure. The explanation appears relatively simple when it is pos-

ulated that all plastic flow is necessarily accomplished in high polymers by sliding of molecules over each other. As the molecules increase in size and become longer chains, the attractive force or interlocking of adjacent molecules or portions of molecules may be of greater strength than the primary valence bonds between atoms in the molecule especially under the oxidizing conditions present with the result that when mastication occurs some of these primary valence bonds are ruptured and the molecules become shortened. This takes place in ordinary rubber mastication and is evidenced by the increased plasticity and by the decreased physical properties of the final vulcanizate as well as by a decrease in intrinsic viscosity.

It has been recognized that such degradation occurs, but as previously mentioned, it has been considered necessary for processability in the factory which is a controlling factor. When a compatible oily plasticizer or a compatible plasticizer, which is liquid or viscous at the mixing temperature, is incorporated into the tough rubber, it apparently enters in between the molecules to lubricate them so that they slide more easily on each other so that they are not subjected to sufficient strain to rupture the bonds or the oil prevents oxygen attack and the polymer is not broken down or deteriorated to any appreciable extent as in the case where the mastication is accomplished in the absence of sufficient plasticizer for such lubrication or protection. Appreciable degradation of molecules by mastication is apparently only had when the molecules are sufficiently large for their intermolecular forces to be greater than the bond strength between molecules under oxidative conditions. After a given rubber has been deteriorated or plasticized to such an extent that the molecules are relatively small mastication may be continued with no physical rupture of the molecules. It is, therefore, seen that degradation by mastication alone is much more severe in the high Mooney or very tough rubbers which have large molecules than in the case of the softer or lower Mooney rubbers.

As aforementioned the effect of liquid or solid plasticizers in large amounts is to deteriorate the properties of the ordinary compounds made from general purpose rubbers, particularly natural rubber. This is illustrated by Figure 1 of the drawing which shows the properties of an ordinary natural rubber tread compound having varying amounts of a rubber plasticizer therein. A comparison of the properties of the vulcanizates from such rubber compounds shows that as the plasticizer is increased the properties become progressively worse.

In the case of the high Mooney or tough rubbers with which the present invention is concerned, it is found that some of the properties of a vulcanizate prepared from rubber compounds having a plasticity sufficient for processing are even improved by the addition of the oil plasticizers. Tough rubbers of which the present invention is concerned which are vulcanizates of a factory processable compound form articles such as tire treads which are improved with increasing addition of oil until a certain maximum is reached whereupon they decrease. Apparently, the deteriorating effect of the plasticizer is less than the improvement caused by the preventing of bond rupture during mastication through molecular separation or insulation until the amount of plasticizer becomes quite large. It is, therefore, seen that properties at least as good as those obtained from the standard factory processable polymers without any plasticizer whatsoever may be obtained with relatively large amounts of inexpensive plasticizer or softener providing the rubber has sufficient toughness or high Mooney plasticity.

In forming rubber compounds in accordance with the present invention it is as above indicated unnecessary and, in fact, we have found it undesirable to masticate and break down the high Mooney rubber so that it forms a compact bond or plastic mass prior to the addition of the oil as was the general compounding procedure in the past.

In order to obtain maximum advantage from the tough high Mooney rubbers these rubbers should be combined with oil when in the finely divided state so that the oil can enter (be absorbed) between molecules of the rubber to facilitate slippage one on the other before they are ripped apart and broken-up by mastication. If the high Mooney rubbers are obtained in the form of a bale or large mass, they should for best results be pulverized or granulated to a powdery or crumblike state prior to contact with the oil. Such is accomplished without deteriorating the rubber. In contrast to low Mooney rubbers such as standard GR-S (Government Synthetic rubber, a general purpose butadiene-styrene copolymer), the high Mooney rubbers, when masticated in a Banbury mixer, will usually form a pulverant mass because of the lack of plasticity when they are incorporated into a Banbury mixer or the like. Frequently, however, this is not the case. In such cases pulverization of the entire material may be accomplished by adding small amounts of carbon black or other pigment with the rubber before plasticization has occurred so that the rubber particles are insulated from each other and prevented from being packed together as they are formed by the mixing apparatus. When the required amount of oil or other suitable plasticizer is added at the time the material is in a finely subdivided condition it is uniformly absorbed and best results are obtained. Addition of large proportions of oil used in the practice of the present invention to a large solid mass of rubbery polymer makes it more difficult to produce a homogeneous compound. When the rubbers are in the finely divided state, they are rapidly swelled by the oil without deterioration and the rubber particles thereafter readily agglomerate to form a plastic mass.

By utilizing our preferred procedure factory processable rubber compounds may be made in the very short time commensurate with ordinary procedures based upon the relatively highly modified and easily processable commercial synthetic rubbers. The rubber articles such as tire treads produced from the compounds having large amounts of oil are equal to and in many cases considerably superior in properties to those produced from conventional mixes.

When the rubber is available in the form of a latex, the oil is preferably first emulsified and incorporated in the latex in the emulsified form and the mixture suitably coagulated. Preferably a so-called shock method of coagulation is used wherein the coagulable latex-oil emulsion mixture is passed into a large mass of coagulating medium such as salt and acid. Even unemulsified oil may also be incorporated into the wet coagulum or crumb even in the presence of free drainable water and it is found it will be selectively absorbed even in the presence of such water.

In the compounding of the synthetic rubber-oil mixtures the total quantity of oil plus synthetic rubber is considered to be rubber. By this method compounds formed in accordance with the present invention generally have hardness and physical characteristics similar to normal compounds made from commercial easy processing synthetic rubbers. To illustrate this, a good tread compound having 100 parts of rubber and 50 parts of carbon black generally gives properties which are desirable. Using tough rubber-oil combinations with 100 parts of rubber and 100 parts of oil, we would utilize 100 parts of the carbon black for about equal hardness and comparable properties.

Proper characterization of a given polymeric material may not always be made directly by means of a Mooney plastometer reading on the raw polymer, as gel content, gel distribution, and molecular weight affect the polymer and are not indicated by a Mooney plastometer. When a polymer is exceptionally tough so that it would have a Mooney reading about 120, slippage between the rotor and polymer frequently occurs with the result that the Mooney reading may be in error and not reliable.

Furthermore, when the tough particles are distributed within softer particles of a rubbery polymer or when a non-homogeneous or a gel containing polymer is had, the Mooney plasticity reading frequently fails to characterize the polymer. Thus, while a Mooney plastometer is satisfactory in distinguishing between rubbers having no gel but of varying molecular weights until the Mooney reading is about 120 (where slippage or tearing may occur), it fails to distinguish between such rubbers and rubbers having substantial gel content. Gel containing rubbers require substantially increased amounts of plasticiser.

Reference should be had to the accompanying drawings in which:

Figure 1 is a graph showing the effect of softeners on the tensile strength of natural rubber;

Fig. 2 is a graph in which the plasticities of various raw polymers are plotted against the amount of oil in compounds of the same polymer containing oil and carbon black in an amount equal to one half the combined weight of the polymer and oil to provide compounds having plasticities of 40, 60 and 80 measured as indicated on a Mooney plastometer.

Fig. 3 is a graph in which modified "tensile product" value of various compounded polymers are plotted against their oil content to indicate the effect of the oil on certain physical properties of the compounds.

We have found that in any given polymer modified so as to have substantially no gel, the amount of oil required to obtain a compound of a given plasticity varies directly with its Mooney pasticity and directly with its intrinsic viscosity. Thus, there is a substantially straight line relationship between the amount of a given oily plasticizer required to obtain a given compounded Mooney and the raw Mooney reading when plotted as illustrated in Fig. 2 providing a given carbon black such as a fine reinforcing furnace black for example "Philblack O" (a structural typeof fine high abrasion furnace black of the Phillips Petroleum Company) is utilized and the amount of the carbon black is equal to a given percentage of the total weight of rubber plus oily plasticizer say 50 percent of the totalof these two materials. We have also found that the compounded Mooney of a given polymer varies in approximately a straight line relationship with the amount of a given oily plasticizer contained therein. If therefore, the polymers are of a non-gel type, and vary only by molecular weight as indicated by intrinsic viscosity measurements, then the curves obtained by plotting parts of oil necessary to obtain a given compounded Mooney (CML-4') versus measured raw Mooney of the polymer are approximately parallel lines especially when the accuracy of duplication and measurement is considered. We have made use of this fact as hereinafter further explained to develop the term "computed Mooney" which applies to all synthetic rubbery polymeric materials, regardless of how they are obtained. The "computed Mooney" of a gel containing polymer is the true Mooney of an equivalent gel free polymer. In Figure 2 calculated or "computed Mooney" is plotted versus parts of oil (Sundex 53) required in the various gel free polymers to obtain compounded Mooney values of approximately 40, 60 and 80 as shown by lines A, B, and C respectively with a short mixing cycle of not more than 2 minutes as hereinafter described. The computed Mooney and the measured raw Mooney are the same within accuracy of measurement at the lower values, i.e., below 120 for these gel free polymers.

In order to properly prepare tires and particularly extruded treads of tires, the compounded Mooney of the compounds used should generally lie between 40 and 80. When the rubber compound is too plastic (too low a Mooney, for example much below 40) difficulty is had in holding shapes and when the compound is not sufficiently plastic, i.e., has over 80 Mooney, great difficulty is had in overheating and scorching in the extruding operation as is had in a calender tuber or the like necessary for forming extruded tire treads of uniform section. It is preferred that the compounded Mooney of the rubber compound be within the range of 50 to 70. Line B, curve for compounded Mooney values of 60 is therefore squarely in the center of the range preferred for factory processing. The slope of this line was obtained by plotting the measured raw Mooney reading of gel free polymers against the amount of oil required to obtain a compound with a 60 CML-4' (compounded Mooney of 60 measured with the large rotor at four minutes). Slopes and positions for 40 CML-4', and 80 CML-4' lines were obtained in the same manner except that the compounds were made to 40, and 80 compounded Mooney respectively. One may find "computed Mooney" of a given polymer utilizing the graphs of Figure 2 by preparing a rubber carbon black mixture with a given amount of oil utilizing the mixing procedure described below and measuring the Mooney of the compound in the ordinary manner using the large rotor of a standard Mooney plastometer and reading the value at four minutes.

If the measured four minute compounded Mooney (CML-4') of the compound falls in the neighborhood between 40 to 80 i.e. near any of lines A, B, and C the "computed Mooney" may be simply read from the scale designated "computed Mooney" using standard interpolation or extrapolation procedures. If the measured compounded Mooney is substantially removed from the range of 40 to 80 another compound with greater or less oil may be prepared showing a compounded Mooney close to this range and the amount of oil and actual Mooney level may thereupon be read by interpolation procedure.

As above explained, sample compositions made for the purpose of computing the Mooney viscosity of a polymer have a fine reinforcing-furnace carbon black (a high abrasion furnace black) content equal to one-half the combined polymer and oil content. As shown in Fig. 2 a sample having 30 parts by weight of oil to 100 parts by weight of polymer and a measured Mooney plasticity of 60, would have 65 parts by weight of said carbon black and the computed Mooney plasticity of the polymer would be approximately 90. It will be apparent that the polymer of any sample having 30 parts of oil and 65 parts of said carbon black and a measured Mooney plasticity greater than 60 will have a computed Mooney plasticity above 90. Conversely, a sample with 30 parts of oil and 65 parts of said furnace carbon black to 100 parts of polymer of above 90 computed Mooney plasticity, will have a measured Mooney plasticity greater than 60. As will be seen from the graph in Fig. 2, a similar relationship holds true for samples requiring various oil contents to bring them to a workable plasticity. For example, a sample composed of 100 parts of a polymer, 40 parts of oil and 70 parts of said carbon black that has a measured Mooney plasticity of 60, has a computed Mooney plasticity of approximately 110, a sample composed of 100 parts of a polymer, 50 parts of oil and 75 parts of said furnace carbon black that has measured Mooney of 60, has a computed Mooney plasticity of about 130; and a sample composed of 60 parts of oil and 80 parts of said furnace carbon black that has a measured Mooney of 60 has a computed Mooney of about 150.

The mixing procedure used for evaluating a polymer may, of course, affect the plasticity of the compounds obtained with a given amount of oil or softener. Long mixing times, particularly in the presence of insufficient softener will considerably deteriorate the polymer and result in lower Mooney. Even in the presence of substantial amounts of softener the substantially increased mixing times have slightly adverse effects on the polymer. If, therefore, in preparing a factory batch insufficient oil has been added to provide the processability necessary for

factory operations, increased processability may be
d by remixing the material without any additional oil.
n preparing rubber compounds for evaluation the
gh rubber is incorporated in a warm laboratory Ban-
y mixer (approximately 200° F.) worked for about
minute whereupon the tough rubber tends to break
o fine crumbs which will not work into a cohesive mass
the Banbury. The oil is added in one or two incre-
nts depending on the amount of softener used and
rked for four to six minutes. The oil should prefer-
ly be absorbed in the rubber before any carbon black
dded, but the black can be added before the oil is com-
tely absorbed if desired. When the polymer fails to
eak-up into a fine crumb in the Banbury a small
nount of the black may be added initially to insure the
rmation of a fine crumb. The carbon black is added in
veral increments and worked four or five minutes until
fairly cohesive mass is obtained. Cold water is prefer-
ly circulated through the Banbury during the carbon
ack addition in order to prevent excessive temperature
e. The total mixing time should be only that required
obtain a cohesive mass. The mix should immediately
placed in a cold tight laboratory mill (6" x 12" rolls)
d milled for two minutes at .050 separation of rolls al-
wed to cool one-half hour and the compounded
looney determined. When the rubber compound is to
used for the production of rubber articles the usual
ompounding ingredients may be added on a second pass
rough the Banbury mixer requiring about two to four
inutes for the addition of the materials.

We have found that for any given "computed Mooney"
ading or for any given actual measured Mooney in a
ven type of polymer there is a minimum amount of oil
hich is required for satisfactory processing without long
nd uneconomical mastication cycles and mixes. When
he rubber into which the oil or other plasticizer is in-
orporated has a computed Mooney of 90 about 30 parts
f oil or other liquid softener is usually required for each
00 parts of rubber to obtain a 60 Mooney compound
(60 CML-4') and 20 parts of oil are required to obtain
70 CML-4' which is on the less plastic side of the more
esirable factory processibility range. Where the bene-
ts of the present invention become more impressive i.e.
t "computed Mooneys" above 115, at least 30 parts of
il are usually required to obtain a factory processable
0 Mooney compound and about 40 parts for a 60
Mooney compound using the 50 parts of black per 100
arts of rubber. When the "computed Mooney" plas-
icity (if the compound is gel free and prepared at low
emperature) or when the measured Mooney is about
120, at least 35 parts and preferably about 40 parts of oil
s desirable in order to provide the desired factory
rocessibility. When the "computed Mooney" plasticity
of the rubber is 150 or above, at least 45 to 50 parts of
the oil are required to obtain the same processibility, and
as much as 75 parts by weight of oil may be present per
100 parts by weight of a synthetic rubber without giving
tire treads having inferior properties to those made from
standard GR-S as presently manufactured. Even more
oil, say 100 parts may be used when the black or pigment
content is increased above the 50 percent of oil plus black
which loading we have found to be exceedingly satisfac-
tory. When the Mooney plasticity reads about 150, 50
to 75 parts of oil are generally most desirable for high
quality tire treads. As much as 200 or even 250 parts of
oil or other plasticizer may be used in some compounds
with 100 parts of the toughest rubbers to obtain products
of surprising value combined with low cost.

It has been our experience that synthetic rubbers hav-
ing a computed Mooney of appreciably over 70 cause
great difficulty in factory handling and have been con-
sidered undesirable for factory use without premastication
or deterioration treatments. When the computed Mooney
is 80 or above, factory handling according to prior meth-
ods has been substantially impossible. The maximum

benefits of the present invention are obtained with synthetic rubbers having computed Mooneys much above those which are considered useable in factory production although substantial benefits of the present process are obtained when the computed raw Mooney of the synthetic rubber used is as low as 85.

Greater benefits are obtained in accordance with the present invention when the computed Mooney of the raw polymer is 100 or more as the amount of oil used to obtain substantially the same properties is considerably increased without disadvantage and greater economies are effected. The low temperature properties of the rubber compound when the preferred low temperature plasticizers are used are improved with increased plasticizer content. The major benefits of the present invention are obtained when the Mooney plasticity is more than 115 or the measured Mooney of a gel free polymer is more than 115, all Mooney being measured with a large rotor at four minutes in accordance with standard procedures.

We preferably prepare polymers with Mooney plasticity of 150 or more in order to use large volumes of inexpensive oil and obtain the tread wear inherent in these unbroken-down polymers. It is as aforementioned, preferred that these very high Mooney rubbers are polymers prepared by low temperature polymerization processes utilizing a highly accelerated system.

The rubber should preferably be homogeneous or if present in mixture with other rubbers such as those of the general purpose type, should constitute a major portion or sufficient proportion such that the computed raw Mooney reading of the mixture is at least 85.

The intermolecular forces of the higher Mooney rubbers with which the present invention is concerned must be greater than the intermolecular forces of the lower Mooney rubbers since attraction of plasticizer would seem to be the same in each instance. So it is readily seen that the compatible plasticizer should be somewhat more readily absorbed by lower Mooney than by higher Mooney synthetic rubbers.

The soft rubbers with large amounts of plasticizer may in turn plasticize the tough rubbers when the "computed Mooney" of an uncompounded mixture, i.e. four minute Mooney reading, without the softener is much less than 85. The preparation of the softer rubber diluted with sufficient softener to become a composite plasticizer may become too great to be effectively disposed between tough polymers and a heterogeneous compound may result. It is apparent for this reason that any artificially created mixture of separately produced high and low Mooney rubbers should have a minimum computed Mooney of 85 to obtain advantages of the present invention. More benefits are of course obtained when the computed Mooney of the mixed polymer is well above 90 or 100 such as for example 115 or above.

In preparing mixtures of high Mooney with low Mooney polymers the two materials should be of about the same plasticity when mixed in order to insure a homogeneous mixture. The high Mooney rubber is preferably mixed with the required amount of oil and plasticizer as aforementioned before it is combined with a lower Mooney polymer. Preferably, both polymers are mixed with the required amount of carbon black prior to combining them. However, reasonably good results are obtained when carbon black masterbatches of the lower Mooney polymer are incorporated with the high Mooney polymer prior to admixing the latter with the oil or plasticizer. The carbon black stiffens the lower Mooney materials particularly when the masterbatch is formed via the latex route and the lower Mooney polymer is unmasticated so that it may have substantially the same plasticity as the high Mooney polymer. It is emphasized, however, that the advantages of the present invention are reduced as the proportion of the high Mooney rubber in a mixture is reduced.

The synthetic rubbers to which the present invention relates are polymers of conjugated diolefinic compounds

such as butadiene, isoprene, dimethylbutadiene etc. having not in excess of and preferably less than eight carbon atoms. Copolymers of one or more diolefinic compounds such as those aforementioned with one or more copolymerizable mono-olefins such as the arylolefinic compounds such as alpha-methylstyrene, 3,4-dichloro-alpha-methylstyrene, p-acetyl-alpha-methylstyrene, and including the arylvinyl compounds such as styrene and halogenated and nuclearly methylated styrenes such as 2,5 or 3,4-dichlorostyrene, 3,4-dimethylstyrene, 3-chloro-4-methylstyrene and unsaturated polymerizable ketones such as methylisopropenylketone, and methylvinylketone.

In the copolymers the total proportion of butadiene and/or other conjugated diolefinic compounds is ordinarily at least 50 percent of the weight of the copolymer. However, we have been able to prepare a very desirable rubbery material by adding oil thereto with as much as 85 percent of monoolefinic compounds such as styrene and 15 percent of butadiene or total conjugated diolefinic compound. Such materials are not suitable for tire treads but are the subject matter of related applications intended to be filed shortly.

The plasticizer should be compatible with the synthetic rubber and any compatible plasticizer even solid or semi solid plasticizers may be used. However, liquid or oily plasticizers are generally considerably superior and liquid plasticizers with a low pour point are ordinarily much superior for low temperature rubbers. In the case of synthetic rubbers made from butadiene or a conjugated diolefin and styrene and in other hydrocarbon rubbers generally, including polybutadiene and polyisoprene, the plasticizer is preferably a mineral oil having a boiling point well above temperatures to be encountered in use. For ordinary usage the plasticizer should not boil below 450° F. and preferably should not boil below 550 or 600° F. Of these, those mineral oils having a low aniline point or high aromatic content are much preferred, especially when the rubber contains styrene or has appreciable amounts of aromatic components.

The particular plasticizer is often selected because of the use for which the rubber article is intended. In the case of tires intended for arctic use, we have found that rubber treads having exceedingly desirable low temperature flexibility may be made by utilizing oils both hydrocarbon oils of low pour point and others such as ethers that are compatible as the softener. This even though the boiling point may be much lower than the 450° F.

most desirable for high temperature use. Most hi[illegible] ing esters are not sufficiently compatible with the Mooney general purpose synthetic rubbers such as butadiene and copolymers of butadiene with s[illegible] and/or methyl isopropenyl ketone to be used alo[illegible] the large amounts required. They may be used i[illegible] mixture with a compatible plasticizer. Ester plasti[illegible] are not as desirable and do not give the desirable p[illegible] ties in hydrocarbon rubber compounds that were tained by the inexpensive mineral oils although so[illegible] the benefits are obtained. Even when the rubber i[illegible] tirely hydrocarbon as in the case of GR-S and poly[illegible] of diolefinic compounds such as polybutadiene or i[illegible] isoprene rubbers, some of the benefits of the presen[illegible] vention are obtained by the use of other plasticizing r[illegible] such as cumar resins, cumarone-indene and various[illegible] eral rubbers and the like. These may be substitute[illegible] a part of the oily softeners aforementioned to obtai[illegible] cial properties. While mineral oils are preferred a[illegible] oily plasticizer and give compounds with excep[illegible] properties, other oily materials such as coal tar oil[illegible] the like may also be used for part or all of the plasti[illegible] What is believed to be the best arctic or low tempe[illegible] rubbery compound yet produced is obtained by the[illegible] ent invention utilizing a substituted phenol (such as [illegible] olite, which is a lower alkyl ether of an alkylated p[illegible] having about 15 carbon atoms in the aliphatic side [illegible] usually having the formula $-C_{15}H_{(27-31)}$ and the [illegible] alkyl group attached to the oxygen generally has no[illegible] than 4 carbon atoms) as the plasticizer in a rubbery[illegible] mer of a butadiene or in a hydrocarbon copolymer[illegible] diolefin and a hydrocarbon mono-olefin such as st[illegible] containing at least 50 percent of the conjugated [illegible] fin such as butadiene. The plasticizers listed bel[illegible] Table 2 have been used in the practices of the p[illegible] invention. The hydrocarbon plasticizers, and pl[illegible] substituted by unsaturated aliphatic compounds are[illegible] ferred for hydrocarbon polymers or hydrocarbon[illegible] thetic rubbers. The various plasticizers or oils a[illegible] therefore equivalent but we have found them useful[illegible] obtaining various desirable specific properties in the[illegible] pounds formed from the high Mooney rubbers.

following are examples of the various types of plasti[illegible] showing identifying data, trade names, manufacture[illegible] suppliers and relative "heat loss" after exposing th[illegible] for the time indicated at 300° F.

TABLE 1

Oil	Manufacturer	Pour Point	Flash Point	Aniline Point	Boiling Range	Heat L[illegible] 300° F. 1 hr.
Sunder 43 (A dark aromatic and naphthenic blend lubricating oil extract consisting of 76% aromatic hydrocarbons and 26% naphthenic hydrocarbons. It has Saybolt viscosity at 210° F. of 90 seconds, a specific gravity of .97. Some of the hydrocarbons have aliphatic unsaturation).	Sun Oil Co.	70° F.	330° F.	130° F.		3
Dutrex 6 (A complex high mol. wt. aromatic and unsaturated hydrocarbon petroleum oil having no volatiles or asphaltic residue and having a specific gravity of 1.02 and a Saybolt viscosity at 212° F. of 147).	Shell Development				+600° F.	1
Dutrex 7 (A hydrocarbon plasticizer of heavy process oil type derived from petroleum and having a specific gravity of 1.0 and a Saybolt Universal viscosity of 142 at 212° F.).	do.		440° F.			1
Circosol 2X (A light green viscous hydrocarbon liquid having the specific gravity of .94, Saybolt viscosity at 100° F. of about 200 seconds and at 210° F. of about 45 seconds. It is a naphthenic type hydrocarbon containing some aromatic oil. It is predominantly naphthenic).	Sun Oil Co.	+10° F.	430° F.	181° F.	+700° F.	1
Califlux OP (Blend of unsaturated components of naphthenic base petroleum. It has a specific gravity of 1.01 and a Saybolt viscosity at 210° F. of 110 seconds).	Golden Bear Oil Co.	45° F.		34° C[illegible]	+665° F.	4

See footnote at end of table.

TABLE 1—Continued

Oil	Manufacturer	Pour Point	Flash Point	Aniline Point	Boiling Range	Heat Loss at 250° F.	
						1 hr.	5 hrs.
old N (Dark brown mineral oil containing about 80% of aromatic hydrocarbons and containing some naphthenic hydrocarbons. It has a specific gravity of 1.03, a Saybolt Universal viscosity of 44 at 210° F.).	Socony Vacuum	Below 0° F.	350° F.	115 [1]	+600° F.	14	31
old C (Synthetically produced entirely aromatic hydrocarbon petroleum oil having specific gravity of 1.02, a Saybolt Universal viscosity at 100° of 34).	do	10° F.	330° F.	66 [1]	+330° F.	2	9
dolite 625 (Cardanol stated to be the monophenolic component of commercial cashew nut shell oil. Cardolite 625 is ethyl ether of cardanol. Some unsaturation in side chain).	Irvington Paint & Varnish Co.					6	14
sofler (Octyl-decyl phthalate)						1	2
tyl phthalate						2	6
158B (Naphthenic light distillate)	Imperial Oil Co.		325	142		14	30
158D (Refined naphthenic light distillate)	do		345	172		1	2
158E (Refined naphthenic heavy distillate)	do		470	207		9	26
158F (Highly refined naphthenic light distillate).	do		345	207		1	1
158O (Highly refined naphthenic heavy distillate).	do		490	270		7	17
158H (Asphaltic plasticizer (Processed oxidized tar)).	do		315			16	33
id Poly B.D. (Low molecular weight olybutadiene).	Phillips Petroleum Co.					7	20
Oil #1 (ASTM Standard Oil)			470° F.	124° C.		1	2
Oil #2 (ASTM Standard Oil)			470° F.	91° C.		1	2
Oil #3 (ASTM Standard Oil)			390° F.	70° C.		16	23
oH (High molecular weight liquid oily olyether).	Thiokol Corporation					4	14
fer 100 (Phenylene)	Binney & Smith					4	9
alENS (C$_{11}$H$_{15}$COO—C$_6$H$_3$(NCOC-H)O$_2$	Carbon & Carbide Co.					4	10
le Light Oil (More volatile than Creosol Oil and more aromatic hydrocarbons. It is a petroleum distillate obtained after the cracking process).	Sun Oil Company	Below 0° F.	325° F.	157° F.		13	30
ville Heavy Oil (Aromatic hydrocarbons largely derived from thermal decomposition of coal or oil).	Neville Company			78.2 [1]			
mond Process Oil (Low pour point oil, purely paraffinic. It is a petroleum distillate obtained after the cracking process has a specific gravity of .883, a flash point of 360, a viscosity at 100° F. of 100, and at 210° F. of 32, an aniline point of 170, and a pour point of 15 to 20° F.).	Standard Oil Company						
dines 16 (Polymerized aromatic resins from cracked petroleum oils. Coumarone indene).	Hewick Standard Chemicals						
dolite 625 (Ethyl ether of vacuum distilled Cardanol. It has two aliphatic double bonds per mol (625 has 0.8 double bond per mol)).	Irvington Paint & Varnish Company.					8	11
dolite 623 (Benzyl ether of Cardanol. Same as Cardanol #625 except the benzyl group is substituted for the ethyl group).	do					8	9

[1] Mixed aniline point.

The polymers having a high "computed or calculated Mooney" as aforedescribed may be prepared by any of the polymerization processes including emulsion and mass type radical polymerization processes and also by the ionic polymerization process including both the alfin catalyst process and the Friedel-Crafts catalyst process. When the rubbers are prepared in emulsion, those synthetic rubbers produced with a redox type system at temperatures substantially below 60° F. we have found produce articles which have superior properties. These so-called cold rubbers particularly when they are made below 50° F. in the presence of some very minor amounts of a modifier are generally substantially gel free or have longer chains in proportion to the number of cross-links than have the higher temperature polymers. They, therefore, apparently have much longer molecular chains. In connection with the so-called alfin process wherein the polymerization is conducted with the alfin catalyst as described in Rubber Age, volume 65, page 58, 1949, in the presence of a solvent or diluent the oily plasticizer, particularly if it is a mineral oil may be substituted for all or part of the diluent or solvent. The alfin rubbers have heretofore been considered undesirable because of their high molecular weight characteristics and the tremendous difficulty involved in breaking them down by milling procedures so that they could be formed into factory processable compounds. As described in the above cited article in Rubber Age, which is an abstract of an article entitled "Butadiene Polymers and Polyisobutylene" which appears in Industrial and Engineering Chemistry, January 1950, pages 95 to 102. As there set forth, one of the alfin catalysts is a complex of the sodium compounds of alcohol and an olefin. For example, sodium propoxide-allyl sodium. The catalysts are generally sodium alkyls complexed with an ether and/or alcohol as described in the above article. The polymerization takes place in mass and proceeds at a satisfactory rate at room temperature or mass.

In accordance with the present invention alfin rubbers may be produced directly in readily useable state or they

may be produced in the same way as previously and the oil or plasticizer added in a Banbury as above-described.

Any of the various carbon blacks may be incorporated in accordance with the present invention either in the latex or during the mastication procedures. The amount of carbon black for a tread compound is, if the plasticizers plus the synthetic rubber are considered all as rubber, substantially identical to that used in the standard methods where the carbon black is based only on the rubber present if compounds of similar hardness are to be had. While any of the carbon blacks including the furnace blacks, channel black, and even thermatomic may be used to obtain compounds suitable for many purposes, the fine reinforcing furnace blacks, particularly those having some structure such as the aforementioned "Philblack O" produce tire treads having outstanding properties and are therefore preferred and the compounds prepared from these fine reinforcing carbon blacks or HAF (high abrasion furnace blacks) have properties which are superior to others. The amount of carbon black and or other pigment such as zinc oxide, titanium dioxide, "Hysil" (silicon dioxide pigment) and the like may vary very widely. Compounds or rubber mixtures without carbon black or with small amounts of carbon black and other pigments are suitable for many purposes including carcass compounds. Compounds with as much as 75 or 80 parts of carbon black based on 100 parts of the total of rubber plus oil are often suitable for higher abrasion compounds.

In tire treads however, the amount of carbon black used is preferably about 30 or 35 percent to 60 or even 65 percent based on the total amount of oil or plasticizer plus rubber present in the compound. Part of the carbon black may be substituted however by other pigments on the basis of equivalent surface area. Lignin incorporated into the latex as an alkaline solution and coprecipated therewith may be used in amounts commensurate with the pigment content of the carbon black.

The present invention is as aforementioned especially suitable for the production of rubber compounds that exhibit high flexibility at low temperatures such as may be encountered in far northern climates. While any of the polymers may be used in making rubber compounds the hydrocarbon synthetic rubbers are generally preferred in tires and of the hydrocarbon rubber compounds those prepared substantially entirely from a diolefin such as butadiene are preferred particularly when the polymerization as aforementioned takes place at a temperature well below 50° C. and preferably not in excess of 60° F. superior results being obtained as the polymerization temperature is lowered.

The synthetic rubbers consisting essentially of polymerized butadiene and/or polymerized isoprene are the preferred polymers for preparing general purpose compounds suitable for arctic purposes and may be used with any plasticizers compatible therewith. The lower the pour point of the plasticizer the lower is the temperature at which the rubber has flexibility.

The effect of oil or plasticizer incorporated before breakdown in preventing the deterioration of the rubber is illustrated by the following:

Example 1

Three polymers having "computed Mooney" values in the raw state of 205, 120 and 55 were prepared. These compounds were prepared according to the standard cold rubber polymerization recipes from a mixture comprising 72 parts of butadiene and 28 parts of styrene. The 55 computed Mooney material was the standard cold rubber GR-S. The polymers were divided into four batches, A, B, C and D respectively, for four different compounding procedures.

Batch A was treated in accordance with the standard compounding procedure used prior to the present invention. The raw polymer was masticated on a cold

tight laboratory mill which differs from a factory m that the rolls can be set almost adjacent each other therefore there is a much greater plasticizing a Each of the tough high Mooney polymers were nately placed on a cold mill for one-half hour then r for one-half hour, again milled for one-half hour, until they were broken down sufficiently to produ compounded Mooney suitable for factory proces The mill rolls were set 0.001" apart. The 205 comp Mooney required 2100 complete passes through the and about twenty-four hours milling to obtain suffi plasticity for a compound made with 50 parts of T black O" for each 100 parts of rubber to have a minute Mooney reading of 62. The 120 compou Mooney also required 2200 complete passes through mill in order that the compound have a Mooney r ing of 65. The standard cold rubber was milled about two hours to produce a compounded Mooney 87 which while it was too high for factory proces could be used for molding tensile strips, etc., in the oratory. Into each of the thus broken down polymers incorporated therein 50 parts of Philblack O, 1 "B.L.E." (A high temperature reaction product of phenol amine and acetone) 3 parts zinc oxide, 1 stearic acid, 0.9 part of accelerator "Santocure" (N hexyl-2-benzothiazole sulfenamide) and 1.25 parts of fur for each 100 parts of the respective polymers. thus compounded rubbers were cured into standard slabs and tested according to standard procedure, 30, 45, 60 and 75 minute cures were made of eac the above compounds. A batch B of each of the p mers was made in the identical manner except that amount of sulphur was increased to 1.75 parts and amount of carbon black was increased to 75 parts.

Batch C of each of the polymers was also made the broken-down polymer in identical manner batches A and B except that 85 parts of "Philblack 70 parts of "Sundex 53" (a dark aromatic and n thenic hydrocarbon lubricating oil extract as previ described), 2.25 parts of sulfur, 0.9 part of stearic 1 part each of B.L.E. and Santocure were used in paring the compound.

Batch D was compounded in accordance with the ent invention. In this batch each of the polymers separately placed in a Banbury mixer and mixed wi and "Philblack O" in accordance with the proced above set forth for evaluating polymers. The poly having a computed Mooney of 205 was mixed wi parts of black and 70 parts of oil. The polymer h a Mooney of 120 was mixed with 75 parts of black 40 parts of oil and the cold rubber 55 Mooney poly was mixed with 50 parts of black and 5 parts of oil.

Inasmuch as both the tensile strength as the elong are important characteristics of a rubber compou has been considered by many authorities that the p characterization of a rubber compound is based on sile product" which is the product of the tensile str times the elongation. Inasmuch as it is obviously the polymer and the 50 parts of black which are n sary for its optimum reinforcement (as developed many years use of synthetic rubber and tire treads) to provide rubbery properties in the compound, th and carbon black are considered merely exte Therefore, in determining the true tensile product compound only the polymer content and 50 parts o black are considered as providing the entire prop This tensile product is indicated in Table 2 both fo compound as extended and on the basis of the amou polymer reinforced with 50 parts of black. Th illustrate when the black loading is 85 and the oil ing is 70 and the amount of additional compoundi gredients is 5, it is seen that there are 260 parts o terial in the particular rubber compound. Only 15 are present in an optimumly reinforced polymer co

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...g 50 parts of black. Therefore, if the tensile product ...tensile times elongation) at optimum cure is 100 for the ...ighly extended compound the tensile product based ...pon the rubber (polymer), plus 50 parts of black pres...nt is, in fact,

$$100\times\frac{200}{155}$$

It will be seen from Table 2 that the tensile product of articles made from factory processable compounds with large amounts of oil without the excessive breakdown of the rubber, is greatly enhanced. These data show that when amounts of oil, in accordance with the present invention, are present during the mixing process, particularly when the polymer is in the finely divided state, the properties of the polymer are not deteriorated and the inherent characteristics of the high Mooney polymers are maintained.

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The compounds were masticated or mixed in accordance with the aforementioned recommended procedure for evaluating polymers and cured into standard test slabs. The slabs having optimum cure were tested as to their low temperature properties in accordance with the procedure recommended by the article by S. D. Gehman, et al., Ind. & Eng. Chem. 39, 1108–1115 (1947) for Gehman values. There is also shown in the following table a GR–S compound containing 5 parts of Paraflux softener which is generally recognized as a standard tread compound. The larger the Gehman value at the temperature indicated the b- er is the low temperature property of the compound. It will be seen that compounds may be prepared in accordance with the present invention with flexibility at temperatures of —75° F. By incorporating even larger amounts of oils such as Diamond Process Oil, Cardolite, high boiling esters and

TABLE 2

Batch	Compounded Mooney[1] of Polymer	Tensile Strength, p.s.i.					Elongation, Percent					Optimum Cure, minutes	Tensile Prod. (Tensile × Elong. of Opt. Cure) (lb Thousands)	Tensile Prod. at (100 R 50 Blk.) lb Thousands)	Compound Mooney[1]
		15' Cure	30' Cure	45' Cure	60' Cure	75' Cure	15' Cure	30' Cure	45' Cure	60' Cure	75' Cure				
A	205	3,120	3,750	3,700	3,830	3,900	710	540	525	490	445	30	2,178	2,178	62
A	120	1,490	2,400	2,780	3,420	3,660	750	600	530	450	470	30	2,040	2,040	66
A	65	113	1,500	2,540	3,420	3,340	760	625	545	540	450	60	1,863	1,850	87
B	205	2,540	3,500	3,640	3,640	3,940	465	310	340	255	270	45	1,043	1,260	134
B	120	2,900	3,650	3,960	3,900	3,500	500	345	300	300	270	30	1,250	1,450	119
B	65	2,560	2,960	3,340	3,300	3,220	470	315	290	215	220	45	935	1,020	139
C	205	950	1,600	2,040	2,600	2,620	720	850	490	455	405	45	1,003	1,000	17
C	120	1,110	2,210	2,340	2,470	2,520	605	645	455	490	435	45	1,073	1,105	20
C	65	240	1,570	2,140	2,220	2,540	740	650	430	435	470	45	939	1,570	28
D	205	1,040	2,775	3,020	3,000	3,120	1,140	765	645	535	495	45	1,535	2,270	65
D	120	1,230	3,100	2,970	3,060	3,040	830	610	525	500	500	30	1,830	2,650	68
D	65	.....	1,580	3,040	3,140	3,300	.....	800	700	665	575	45	2,120	2,050	85

[1] (Large rotor.)

Example 2

The following example illustrates the advantage had from the present invention in preparation of rubbers for cold climates and the differences obtainable by selecting mineral oils mentioned, still better Gehman values are obtained in stocks having desirable properties. The present invention is therefore highly satisfactory for the production of articles used in arctic regions.

TABLE 3

[Gehman Data Relating Angular Twist to Temperature]

Pts. Oil Used	75° F.	65° F.	45° F.	35° F.	25° F.
60 Sundex 53 (A dark lubricating oil extract as above described)	.....	.....	1	2	78	150
60 Circosol 2XH (a viscous hydrocarbon liquid as above described)	.....	.....	10	28	109	180
60 Sovelolt C (synthetic substantially entirely aromatic hydrocarbon oil dry from petroleum as above described, Cardolite 25, ethylether of Cardiol as above described)	.....	.....	2	29	142	.....
60 Cardolite 625	5	22	65	134	.....	.....
60 Dioctyl Phthlate	.....	5	33	90	145	.....
60 Diamond Process Oil (liquid petroleum distillate as above described)	1	14	100	144	154	167
60 Circle Light Oil (liquid petroleum distillate as above described)	.....	.....	2	68	116	133
52 Sundex 53	.....	.....	.....	.....	.....	.....
40 Circle Light Oil	.....	2	5	30	135	168
OR-8 (5 pts. Paraflux (a saturated polymerized hydrocarbon liquid having a Saybolt viscosity at 100° C. of 77 seconds and having a specific gravity of 1.03))	.....	.....	2	20	97	125

plasticizers and amounts thereof. Rubber compounds were prepared with the plasticizers shown in the following Table 3. The following formula in which parts as always herein are by weight was used in valuating the polymer:

FORMULA

	Parts
Rubber	100
Philblack O	75
Stearic acid	2
Zinc oxide	5
Sulfur	2
Santocure	1
...ener or oil	Indicated in Table 3

Example 3

Several polymers were made by polymerizing styrene and butadiene in the ratio of 72 parts of butadiene to 28 parts of styrene at 41° F. utilizing standard cold rubber recipes, the amount of modifier MTM mercaptan necessary to obtain computed Mooneys, 51, 63, 85, 95, 104, 124, 162, 205 and 245 at 72% conversion was used. These polymers were compounded in accordance with the procedure above described for the evaluation of polymers, the parts of oil and black indicated in the following table. Each of the compounds was cured for 15, 30, 45, 60 and 75 minutes respectively. The optimum

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cure was selected and the S value calculated in accordance with the following formula:

$$S = T\left(\frac{E+100}{100}\right)$$

T is the tensile strength measured and E is the elongation. The S value is described in an article by Dr. Samuel Maron et al., appearing in Industrial Engineering Chemistry, volume 40, page 2220 (1948), as being more satisfactory than even "tensile product" for evaluating polymers as it takes into account the reduction in cross section at break due to elongation. The S value at optimum cure and the S value calculated back to a standard compound of 100 parts of polymer, 50 parts of black and 5 parts of oil is shown in the following Table 4, together with the parts of modifier oil and black used in preparing tread compound. S value vs. parts of oil (Sundex 53) used for each polymer is shown in Figure 3. An arrow placed on each of the curves indicates the point where 60 Mooney is obtained in the compound. It will be seen that the polymers of about 85 or 90 Mooney and above have inherently much superior properties when mixed with more than 25 parts of oil and these properties are maintained when enough oil is present during the mastication.

TABLE 4

Polymer	Computed Mooney of Polymer	Parts oil added (per 100 rubber)	Parts Black	"S" Value for Optimum Cure	Calculated "S" Value (based on 100 Rubber, 50 Black and 5 Oil
A	81	5	50	23,000	25,000
A	81	30	67.5	26,000	28,000
B	63	5	50	34,000	34,000
B	63	30	65	20,000	25,000
C	85	10	65	17,100	18,750
C	85	20	60	21,000	25,000
C	86	30	65	22,000	27,400
C	65	60	75	17,000	26,000
D	65	15	67.5	25,000	24,000
D	93	30	65	21,500	27,300
D	93	40	72	26,000	28,000
E	104	35	67.5	21,000	26,000
E	104	35	67.5	20,000	28,300
E	104	50	75.0	18,700	27,700
E	104	35	65.0	16,700	28,000
F	124	25	62.5	25,000	31,000
F	124	40	70	27,200	37,000
F	124	55	77.5	15,000	24,300
G	162	30	65	12,900	16,600
G	162	45	72.5	24,200	34,700
G	162	60	80	10,400	20,000
G	162	60	90	19,700	35,000
H	205	40	70	15,300	21,200
H	205	70	85	18,000	31,200
H	205	80	90	19,700	35,000
H	205	90	95	18,100	33,600
I	226	45	72.5	8,050	11,650
I	226	75	87.5	9,000	25,600
I	226	90	95.0	12,000	33,200
I	226	110	105	18,900	39,000

Example 4

1000 lbs. of a polymer was made by polymerizing 72% butadiene and 28% styrene to 72% conversion at 41° F. using a potassium soap approved by the Rubber Reserve Corporation designated by the trade name a potassium stearate meeting specifications of the office of the Rubber Reserve Corporation as K-ORR as the emulsifying agent in the amount of 5%. The polymer thus produced had a computed Mooney of 195.

The latex of the polymer thus prepared was mixed with an emulsion of oil "Sundex 53" and a dispersion of carbon black. The "Sundex 53" emulsion was made by using 100 parts of "Sundex 53," 2 parts of oleic acid and 2 parts of ammonium hydroxide. The "Philblack O" slurry was made with 100 parts Philblack O and 4 parts Indulin A (lignin), 0.6 part sodium hydroxide and water to give a 15–16% total solids content in the slurry.

The latex and slurry and emulsion were mixed together in an amount sufficient to provide 55 parts of "Sundex 53" and 75 parts of "Philblack O" per each 100 parts of latex. The mixture was coagulated with salt

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and acid to obtain a crumb which was dried and then out in slabs on an 84" mill. The further compound and mixing were carried out in a #11 Banbury. It compounded in accordance with the following for

(Masterbatch)	
Sundex 53	
Philblack O	
ZnO	
Stearic	
Santocure	
B.L.E.	
Sulfur	

The stock thus prepared when attempts were m to process in the factory was somewhat too stiff for results and had a compounded four minute Mooney o

The material was extruded in the form of tire tr and applied to identical 7.60 x 15 tire carcasses w were tested against two standard synthetic rubber trols. The results of the tire test are as follows:

[Tire test (7.60 x 15)—Miles/0.001 of tread]

Miles	(control) GRS		105 Mooney Polymer		Th Ru Po
4,700	35.6	37.8	42.4	43.2	
8,400	35.8	39.0	41.3	44.7	
10,900	34.6	37.8	41.3	43.0	
12,600	37.7	35.9	42.0	45.3	
14,700	42.1	43.7	44.0	46.1	

The tires were 7.60 x 15. The miles per 0.001 tread wear are indicated in the above table, as w the comparative tread rating of the tires for the Mooney polymer relative to the control.

Example 5

A polymer of butadiene and styrene containi parts of butadiene and 28 parts of styrene was poly ized at 41° F. in the presence of 0.12 part of MT trade name for a mixture of tertiary mercaptans sisting of tertiary mercaptans of 12, 14, and 16 c atoms, having about 60% of the 12 carbon atoms 20% each of 14 and 16 carbon atom mercaptans). conversion was 72% and the "computed Mooney" resultant polymer was 120.

A second polymer of identical butadiene and st content was polymerized under the same condition cept that the mercaptan content was reduced to .8 of the MTM mercaptan. The "computed Mooney" resultant polymer was 175.

The latices from each of these polymers were ately coagulated and dried to give a fine crumb o polymer. The separate crumbs obtained were pounded in the tire tread compositions in accord with the following table:

TABLE 5

	8333B (Control)	8344A
Cold Rubber Masterbatch (100R-50B)	150	
Cold Rubber Masterbatch 120 Mooney Polymer		100
Cold Rubber Masterbatch 175 Mooney Polymer		
P.C. (Philblack-O)		75
Sundex 53		25
ZnO	3.0	3
Stearic	1.0	1
M.R. (mineral rubber)	5.0	
Paraflux	5.0	
(0.8 Santo.) Acc. Master		
(0.9 Santo.) Acc. Master		4.5
Santocure	1.4	
B.L.E.	0.8	0.8
Stabilite	0.5	0.5
Sulfur	1.8	2.0
Total	173.5	222.1

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A standard cold rubber compound was used as a control. The formula for such standard compound is as shown in Table 5.

In preparing the compounds the polymer in crumb form was added to the Banbury and allowed two minutes more to break the crumb into a finely divided form. The oil was thereupon added and about three minutes later the carbon black was added. When the batch temperature rose to 350° F. the batch was dropped. The accelerator, antioxidant and other materials were mixed into the rubber the following day by means of another pass through the Banbury. The compounds thus produced were extruded through the orifice of a tubular machine into tire treads of similar shape and size to prepare 7.60 x 15 tires.

The physical characteristics of the compound were obtained by curing samples of each thereof for the times indicated in the following table:

TABLE 6

	Cure Time, minutes	6323B—x 656	6344A—Blend 2	6346A—Blend 3
Cure 307° F.:				
	15	----------	200	285
	30	635	1,125	990
300% Mod.	45	760	1,400	1,300
	65	1,075	1,725	1,600
	90	1,145	1,725	1,725
	15	----------	725	1,305
	30	2,700	2,630	2,340
Tensile	45	2,630	2,170	2,340
	60	2,130	2,230	2,270
	90	2,610	2,050	2,200
	15	----------	815	760
	30	765	650	615
Elongation	45	600	610	615
	60	620	600	620
	90	690	640	630
	15	----------	60	62
	30	63	65	65
Hardness	45	63	61	66
	60	63	63	67
	75	65	63	68
Rebound	60	66	67	67

The rubber stock prepared from the cold rubber masterbatch had a Mooney plasticity of 62 after extrusion, the Mooney plasticity of the stock produced from the 120 polymer was 74 after extrusion, and the Mooney plasticity of the compound prepared from the 175 Mooney polymer was 63 after extrusion, all plasticities being measured with the large rotor at four minutes.

Tires having treads applied on identical standard carcasses were made with each of the aforementioned treads. The tires were tested on a test fleet in the ordinary manner in the summer in California. The tread wear data is shown in the following table:

TABLE 7

[Tire test 2343 (7.60 x 15)]

Tire No.	Miles	Miles/0.001 tread	Rating, percent
	8,400	48.6	100
Cold Rubber Control, 6323B	16,800	80.3	100
	18,630	smooth	----------
	8,400	67.7	123
20 Mooney Polymer, 6344A	16,800	66.9	133
	18,630	64.5	----------
	8,400	63.9	125
20 Mooney Polymer, 6346A	16,800	62.9	126
	18,630	63.8	----------
	8,400	61.3	127
175 Mooney Polymer, 6346A	16,800	63.2	127

Example 6

In order to show the advantage of high Mooney rubber oil mixtures when mixed with lower Mooney polymers such as standard GR-S (Government reserve synthetic rubber) tires were prepared utilizing only 20% based on rubber of the high Mooney polymers in the compounds from which the treads were formed. The specific compounds are shown in the following table:

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TABLE 8

	A	B
Polymer A	20	----------
Polymer B	----------	20
GR-S—Black Masterbatch, (50 Philblack-O—100 GR-S)	120	120
Sundex 53	16	12
Philblack-O	17	15
B.L.E.	.8	.8
Stabilite	.8	.8
Zinc Oxide	3.0	3.0
Santocure	1.0	.9
Sulfur	1.9	1.9
	169.5	174.4

In making the mixtures the amounts of GR-S black masterbatch of polymer A and polymer B indicated in the above table were placed in a Banbury mixer and blended together for two minutes, whereupon the oil indicated in the table and black indicated in the table was added. The mixing was continued for four minutes and the remaining ingredients added. The sulfur and accelerator were added on a second pass through the Banbury. The total mixing time was nine minutes. The amount of oil used was that required for the high Mooney polymer plus the oil required to obtain a 60 to 70 compound Mooney.

Compounds thus obtained were extruded into tire treads and applied to standard tire carcasses, each having a plurality of plies extending from bead to bead and intermediate layers of rubber.

The tread wear rating of the various tires after 12,600 miles on a test car relative to a standard 100% GR-S control is shown in the following table:

TABLE 9

[Tire test data—(7.60 x 15)]

	Relative treadwear rating
20% polymer A (195 computed Mooney)	104
20% polymer B (120 computed Mooney)	112
GR-S control (50 Philblack-O)	100

The preceding example shows that some advantage may be obtained with even relatively small amounts of polymer in admixture in an ordinary easy processing rubber. It should be emphasized the main advantage and economies of the present invention are minimized by the small proportion of the high Mooney rubber mixture used.

While we have emphasized in the preceding examples the formation of tire treads the high Mooney rubber mixtures are also applicable to the production of tire carcass stocks which have an advantage not only in economy but in that they are more efficient and develop less heat upon flexing at elevated temperatures than the stocks made from the usual synthetic rubbers. An example of a suitable carcass compound is as follows:

Example 7

Polymer 120 ML-4	100
Sundex 53	30
Philblack A	50
"Koresin" (reaction product of P tertiary butyl phenol and acetylene)	10
B.L.E.	1
Zinc oxide	3
Sulfur	2
Altax	1.2
Monex	0.3

The above compound is mixed the same way as is the tread compound in the preceding examples. The carbon black used is a high modulus furnace black. No difficulty is had as in GR-S with incorporating the required amount of Koresin to obtain tackiness. The com-

pounded Mooney of the stock is less than 60 and is suitable for application to suitable rayon cord fabric. Tire carcasses constructed in the ordinary manner except that the above compound may be used with treads of various compositions.

The high Mooney oil mixtures of the present invention may also be combined with natural rubber to produce compounds also suitable for the preparation of tire carcasses. The following example in which parts are also by weight illustrates such compound:

Example 8

Polymer 120 ML-4	66.6
Natural rubber	33.3
Sundex 53	20
Philblack A	50
B.L.E.	1
Zinc Oxide	5
Sulfur	2.25
Altax (accelerator)	1.0
Monex (accelerator)	0.2
Stearic Acid	2

(Altax is benzothiazole disulfide; Monex is tetramethylthiuram monosulfide.)

In mixing the above the oil is mixed with the 120 Mooney polymer and after it is absorbed, this polymer is mixed with the natural rubber and the B.L.E. The black is then added and the mixing continued until the materials go together. The additional ingredients are added in a separate mix. The compound in the preceding example is used in the construction of tire carcasses.

Example 9

A flame resistant rubber is prepared by polymerizing a mixture of 70 parts of butadiene and 30 parts of methylisopropenyl ketone in emulsion the substantial absence of modifier to produce a polymer having a computed Mooney of 200.

The polymer is compounded according to the following formula:

	Parts
200 Mooney BD/MIK (70/30)	100
Tricresyl phosphate	70–80
Hisil (a finely divided silica having a particle size of about 30 milomicrons)	90
Sulfur	3
Altax	1.5
Tuads (tetramethylthiuram disulfide)	0.3
ZnO	5.0
Stearic	2.0

In the examples herein the plasticizer particularly mentioned may be substituted in whole or in part by other plasticizer mentioned. It is again emphasized that the plasticizers are not equivalent for all purposes. The hydrocarbon and general purpose high Mooney synthetic rubbers are most compatible with the hydrocarbon oils, mineral rubber, and plasticizer mixtures comprising hydrocarbon plasticizers particularly when they have an aromatic content.

The present invention affects great economies in the amount of synthetic rubbers utilized. It is largely possible because of the difference in character between synthetic rubbers and natural rubber, the different breakdown characteristics and the toughness of character inherent in the polymer.

It is also apparent that modifications of the invention may be made without changing the spirit thereof, and it is intended that the invention be limited only by the appended claims.

What we claim is:

1. A pneumatic tire having a tread portion comprising a vulcanized synthetic rubber compound containing a non-oil-resistant rubbery polymerization product of a conjugated diolefinic compound having not in excess of 8 carbon atoms, said polymerization product being

compatible with hydrocarbon mineral oils and of a toughness such that a composition composed of 100 parts by weight of said polymerization product, 30 parts of hydrocarbon oil and 65 parts of a high abrasion furnace carbon black will have a Mooney plasticity of at least 60, said rubber compound containing 20 to 100 parts of a compatible plasticizer based on the weight of said polymerization product in said compound.

2. The pneumatic tire set forth in claim 1 in which the compatible plasticizer is an oil and in which the said tread portion contains 30 to 100 parts of said oil based on the weight of said polymerization product in said compound.

3. The pneumatic tire set forth in claim 2 in which said tread portion contains 30% to 80%, by weight, of a reinforcing carbon black pigment based on the total weight of said polymerization product and oil.

4. The pneumatic tire set forth in claim 3 in which the said polymerization product of said toughness constitutes the major portion of all solid polymers of diolefinic compounds that may be present in said vulcanized rubber compound.

5. The tire set forth in claim 1 in which the said polymerization product is a hydrocarbon polymerization product of a conjugated diolefin, in which the plasticizer is substantially hydrocarbon oil having a boiling point above 450° F. and is present in amounts of 35 to 100 percent based on the weight of said polymerization product and in which the tread portion contains 35 to 80 percent of carbon black based on the total weight of said polymerization product and plasticizer.

6. The tire set forth in claim 1 in which the said polymerization product is a copolymer of butadiene and a copolymerizable aryl olefinic compound and in which said copolymer constitutes the major proportion of all of the solid polymers of diolefinic compounds that may be present in said vulcanized rubber compound.

7. The tire set forth in claim 1 in which the rubber compound comprises a hydrocarbon copolymer of a conjugated diolefin with a copolymerizable mono-olefinic compound, said polymer being one polymerized at a temperature less than 70° F. to provide a relatively long chain molecular structure and in which said plasticizer is an oily hydrocarbon.

8. The tire set forth in claim 1 in which said polymerization product is a copolymer of butadiene and styrene, in which the Mooney plasticity of said polymerization product in the raw state is at least 120 and in which the amount of oily plasticizer is more than 70 parts by weight per 100 parts by weight of said polymerization product.

9. The tire set forth in claim 1 in which the plasticizer is largely a hydrocarbon oil, in which the total amount of plasticizer present is at least 45 parts per 100 parts by weight of the polymerization product in the compound, and in which said polymerization product has a toughness such that a composition composed of 100 parts by weight of said polymerization product, 60 parts of a hydrocarbon oil and 80 parts of a high abrasion carbon black will have a Mooney plasticity of at least 60.

10. The pneumatic tire set forth in claim 1 in which the major portion of the synthetic rubber in said rubber compound has a Mooney plasticity of at least 133, in which the plasticizer is a petroleum oil having a boiling point of at least 450° F. and is present in amounts of at least 35 percent by weight of the amount of said synthetic rubber having a Mooney plasticity of at least 135.

11. The pneumatic tire set forth in claim 1 wherein substantial proportion of the polymerization product said diolefinic compound is a copolymer polymerized aqueous emulsion at a temperature below 60° F. and characterized by being substantially gel free, and the amount of oily plasticizer present in the compound

least 35 percent based on the weight of the relatively rough diolefinic compound present.

12. A pneumatic tire having a tread portion that comprises a molded and vulcanized rubber compound containing a non-oil-resistant rubbery synthetic polymerization product of a conjugated diolefinic compound having not in excess of 8 carbon atoms, said polymerization product being compatible with hydrocarbon mineral oils and having a Mooney plasticity of at least 115, a hydrocarbon oil in the amount of at least 40 percent of the weight of said polymerization product, said oil having a boiling point of at least 450° F., and carbon black in an amount of from 30 to 80 percent of the weight of the polymerization product and oil, the major portion of the carbon black being a high abrasion furnace black.

13. A curable rubber tread stock the principal ingredients of which are an aliphatic hydrocarbon compatible synthetic hydrocarbon polymer of a conjugated diolefinic compound of less than 8 carbon atoms, 20 to 100 parts of a compatible plasticizer to 100 parts by weight of said polymer and a high abrasion furnace black in an amount of at least 35% by weight of the combined polymer and plasticizer, said polymer having a Mooney viscosity of at least 100 prior to compounding with said plasticizer and the proportion of plasticizer and carbon black in the composition being that required to produce a tread stock having a Mooney viscosity of from 30 to 70.

14. A curable rubber tire tread stock comprising essentially a hydrocarbon-oil-compatible, rubbery, synthetic hydrocarbon polymerization product of a conjugated diolefinic compound having not in excess of 8 carbon atoms, which compound has a raw Mooney plasticity of at least 90 (ML–4), a reinforcing carbon black pigment, and at least 30 parts by weight of a compatible plasticizer per 100 parts of said polymerization product, said rubber tread stock containing from 30 to 80 parts by weight of said reinforcing pigment per 100 parts by weight of the combined amount of said polymerization product and said plasticizer present, and said tread stock having a Mooney plasticity (ML–4) not appreciably in excess of 80 and not substantially less than 40.

15. A curable rubber tire tread stock comprising essentially a hydrocarbon-oil-compatible, rubbery, synthetic hydrocarbon polymerization product of a conjugated diolefinic compound having not in excess of 8 carbon atoms, which has a raw Mooney plasticity of at least 90 (ML–4), a reinforcing carbon black pigment, and a compatible oily plasticizer, there being from 30 to 100 parts by weight of said oily plasticizer to 100 parts by weight of said polymer and from 30% to 80%, by weight of said carbon black, based on the combined weight of said polymer and said plasticizer present, and said tread stock having a Mooney plasticity (ML–4) not appreciably in excess of 80 and not substantially less than 40.

16. The curable rubber tire tread stock of claim 15 in which the polymerization product is a copolymer of a major amount of said conjugated diolefin compound and a minor amount of at least one copolymerizable monoolefinic compound.

17. The curable rubber tire tread stock of claim 16 in which said copolymer constitutes the major portion of all of the solid polymers of diolefinic compounds which may be present in said tread stock.

18. A curable rubber tire tread stock comprising essentially a hydrocarbon-oil-compatible rubbery synthetic hydrocarbon polymerization product of a conjugated diolefin having not in excess of 8 carbon atoms, a fine, reinforcing, high abrasion carbon black and at least 30 parts by weight of a compatible mineral oil per 100 parts of said polymerization product, said rubber tread stock containing from 30 to 80 parts by weight of said carbon black per 100 parts of the combined amount of said polymerization product and said mineral oil present, said polymerization product being in a substantially non-broken down state and having a raw Mooney plasticity of at least 90 (ML–4), and said tread stock having a Mooney plasticity (ML–4) not appreciably in excess of 80 and not substantially less than 40.

19. A curable rubber tire tread stock comprising essentially a hydrocarbon-oil-compatible rubbery synthetic hydrocarbon polymerization product of a conjugated diolefin having not in excess of 8 carbon atoms, a fine, reinforcing, high abrasion carbon black and at least 30 parts by weight of a compatible softening oil per 100 parts by weight of said polymerization product, said rubber tread stock containing from 30 to 80 parts by weight of said carbon black per 100 parts by weight of the combined amount of said polymerization product and said softening oil present, said polymerization product being in a substantially unmasticated state and having a raw Mooney plasticity of at least 90 (ML–4), and said tread stock having a Mooney plasticity (ML–4) not appreciably in excess of 80 and not substantially less than 40.

20. A curable rubber tire tread stock comprising essentially a hydrocarbon-oil-compatible rubbery synthetic hydrocarbon copolymer of a major amount of conjugated diolefinic compound having not in excess of 8 carbon atoms and a minor amount of at least one copolymerizable monoolefinic compound, a fine, reinforcing, high abrasion carbon black and at least 30 parts by weight of a compatible softening oil per 100 parts by weight of said copolymer, said rubber tread stock containing from 30 to 80 parts by weight of said carbon black per 100 parts by weight of the combined amount of said copolymer and said softening oil present, said copolymer being in a substantially non-broken down state and having a raw Mooney plasticity of at least 115 (ML–4), and said tread stock having a Mooney plasticity (ML–4) not appreciably in excess of 80 and not substantially less than 40.

21. The curable rubber tire tread stock of claim 20 in which said polymerization product having a raw Mooney plasticity of at least 115 (ML–4) constitutes the major portion of all of the solid polymers of diolefinic compounds which may be present in said tread stock.

22. A curable rubber tire tread stock comprising essentially a polymerization product which comprises a copolymer of a major amount of butadiene and a minor amount of styrene, a fine, reinforcing, high abrasion carbon black and at least 30 parts by weight of a compatible softening oil per 100 parts of said polymerization product, said rubber tread stock containing from 30 to 80 parts by weight of said carbon black per 100 parts by weight of the combined amount of said polymerization product and said softening oil present, said polymerization product being in a substantially non-broken down state and having a raw Mooney plasticity of at least 115 (ML–4), and said tread stock having a Mooney plasticity (ML–4) not appreciably in excess of 80 and not substantially less than 40.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,964,083 December 13, 1960

Emert S. Pfau et al.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 18, for "types" read -- tires --; column 3, line 44, for "Figurue" read -- Figure --; columns 9 and 10, Table 1, first column thereof, line 17, for "Circosol 2X" read -- Circosol 2XH --; column 13, lines 36 and 37, for "coprecicte" read -- coprecipitated --; column 14, line 14, for "compounded" read -- computed --; line 53, for "as", second occurrence, read -- and --; columns 15 and 16, Table 3, in the headings of columns 2 through 7 thereof, for "75° F., 65° F., 45° F., 45° F., 35° F. and 25° F." read -- -75° F. -65° F. -55° F. -45° F. -35° F. -25° F. --; column 17, line 59, after "name" insert -- K-ORR --; line 61, strike out "the", first occurrence; same line 61, strike out "as K-ORR"; column 18, line 10, for "Stearic" read -- Stearic Acid. --; line 68, Table 5, first column thereof, for "Stearic" read -- Stearic Acid --; column 21, line 49, for "Stearic" read -- Stearic Acid --; line 60, for "affects" read -- effects --; column 26, line 13, list of references cited, under "OTHER REFERENCES", for "Duismore" read -- Dinsmore --.

Signed and sealed this 18th day of April 1961.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents

RESEARCH CONTRACT
(RuR SR 40)

between

The General Tire & Rubber Company

and

Reconstruction Finance Corporation
dated as of
January 1, 1949
(PX 1241)

THIS CONTRACT made and entered into as of the first day of January, 1949, by and between RECONSTRUCTION FINANCE CORPORATION (hereinafter called "RFC"), a corporation created by the Reconstruction Finance Corporation Act, and having an office for the transaction of business in Washington, D. C., and THE GENERAL TIRE & RUBBER COMPANY (hereinafter called "Contractor"), an Ohio corporation qualified to do business in Texas and having an office and place of business at Akron, Ohio;

WITNESSETH:

WHEREAS, Section 6(a) of the Rubber Act of 1948 (P. L. 469-80th Congress) provides that the Government of the United States is authorized to undertake research in rubber and allied fields by such instrumentalities of the United States as the President may designate; and

WHEREAS, by Executive Order 9942, dated April 1, 1948, the President directed RFC to exercise and perform research functions authorized by Section 6(a) of said Act; and

WHEREAS, RFC and Contractor have heretofore entered into an Agreement (hereinafter called the "Operating Agreement"), dated February 2, 1943, as amended, covering the production by Contractor of Synthetic Rubber (as defined therein) for delivery to RFC; and

WHEREAS, the Operating Agreement provides for the reimbursement by RFC to Contractor of the cost of conducting research, experimental, laboratory, developmental, and pilot plant work to the extent approved in advance by RFC in accordance with arrangements to be mutally satisfactory to RFC and Contractor (all such work being hereinafter referred to as "Research Work"); and

WHEREAS, it is deemed desirable that an arrangement be made between RFC and Contractor relative to patent and other rights which may result from the conduct of the Research Work authorized hereunder;

NOW, THEREFORE, for and in consideration of the premises and the mutual covenants and obligations as herein set forth the parties hereto agree as follows:

1. RFC hereby authorizes Contractor to undertake the following Research Work and to obtain reimbursement therefor pursuant to subparagraphs (h) and (i) of Section 3 of said Operating Agreement, as amended, as follows:

(a) During the period extending from January 1, 1949 to June 30, 1949, inclusive, the Research Work set forth in Exhibit "A" attached hereto and made a part hereof, and to incur expenses in connection therewith not in excess of Seventy-eight Thousand Five Hundred Dollars ($78,500), distributed as set forth in the budget outlined in said Exhibit "A".

(b) During the period extending from July 1, 1949 to June 30, 1950, inclusive, the Research Work set forth in Exhibit "B" attached hereto and made a part hereof, and to incur expenses in connection therewith not in excess of One Hundred Sixty-five Thousand Dollars ($165,000), distributed as set forth in the budget outlined in said Exhibit "B".

2. Contractor hereby agrees to conduct such Research Work during said periods, within said budget amounts, for the benefit of RFC as specified herein. Contractor shall not expend

more during any of the afore-mentioned periods for any individual item contained in the budgets herein authorized than the amounts indicated in the exhibit applicable to the particular period, without obtaining the prior written approval of RFC.

3. The applied and developmental Research Work to be conducted hereunder shall be directed to the determination of generally accepted principles for, and to the adaptation of such principles to techniques for, the production of rubber-like polymers of butadiene, and of rubber-like copolymers, mixed polymers and interpolymers of butadiene with styrene; the content of butadiene being within the range of 50% to 100% by weight of the rubber hydrocarbon present. The scope as above indicated excludes any work under or related to Contractor's "wet smear" invention, covered by Patent No. 2,441,090, but includes carbon black masterbatches and may be further extended by mutual agreement in specific instances.

4. Contractor shall prepare and submit to RFC monthly progress reports and final reports covering in detail all work done hereunder. Said monthly reports shall be submitted not later than the fifteenth day of each following month, and in addition said final reports shall be prepared and submitted promptly upon completion of each distinct subdivision of the work. In addition to said reports, Contractor shall send a representative, well informed in the research provided for, to such meetings as RFC may call.

5. Contractor shall also promptly report and make fully available to RFC or its nominees all information within the scope, as defined in paragraph 3 above, of the research conducted for RFC hereunder (whether patented, patentable, or unpatentable, and irrespective of whether resulting from work reimbursed by RFC) developed or acquired from any source during the term of this contract by Contractor or its Subsidiaries and Affiliates (Companies in which Contractor now has or may in the future acquire, directly or indirectly, fifty per cent (50%) or more of the stock having the right to vote for directors).

6. In addition to the information submitted under paragraphs 4 and 5 above, Contractor shall disclose and make available to RFC or its nominees, to the extent and whenever requested, all information in the possession of Contractor or its Subsidiaries and Affiliates during the term of this contract, which is outside the scope of the research conducted for RFC hereunder, but which is necessary in connection with the utilization of the information so submitted in the production or use of rubber-like polymers, copolymers, mixed polymers and interpolymers of the composition defined in paragraph 3 above; whether or not any of such information results from work, the cost of which is reimbursed by RFC, or whether it is patented, patentable or unpatentable; but such additional information specifically shall exclude that pertaining to subsequent compounding of synthetic rubber, its latices and masterbatches, or pertaining to the preparation of butadiene, styrene, isoprene, vinyl monomers, and of other raw materials, or pertaining to the preparation of accelerators, antioxidants, catalysts, extenders, plasticizers, carbon or lamp black, and of any other agents for use in the aforesaid production or use.

7. Contractor hereby grants to RFC and its nominees (1) a royalty-free license to utilize without limitation any information or invention (whether or not patented) resulting from the research authorized by this contract, including the right to reproduce, disclose to others, and publish all such information or inventions, and including the right to make, use and sell thereunder, and (2) a royalty-free license to use any information or invention to which RFC or its nominees are entitled under the provisions of paragraph 5 above, including the right to reproduce, disclose to others, and publish all such information or inventions, but limited to the utilization of the same in the production, use or sale of general purpose synthetic rubber suitable for use in the manufacture of transportation items such as tires or camel-back, and (3) a royalty-free license with respect to any

information or invention made available under the provisions of paragraph 6 above, limited to the utilization of the same in the manufacture, use or sale of rubberlike polymers, copolymers, mixed polymers and interpolymers of the compositions defined in paragraph 3 above.

8. Contractor shall take such steps as may be necessary to obtain from its employees and from its Subsidiaries and Affiliates the information and rights to which RFC and its nominees are entitled hereunder.

9. Contractor shall promptly notify RFC of the existence of any patent based upon information to which RFC and its nominees are entitled hereunder.

10. RFC may terminate the research authorization contained herein, or any part hereof, without in any way affecting the other provisions of the Operating Agreement or the continuing provisions of this contract in favor of RFC or its nominees, by giving Contractor thirty (30) days' advance written notice. In the event said authorization is so terminated, RFC agrees to indemnify Contractor against loss upon any outstanding commitments which indemnify Contractor against loss upon any outstanding commitments which Contractor may have made in order to conduct the Research Work herein authorized to be conducted, and which Contractor is unable to cancel; provided, however, that in no event shall the maximum amount reimbursable thereby exceed the total amount of the authorization hereunder given to Contractor, less all amounts which RFC may have theretofore reimbursed to Contractor pursuant to this authorization; and provided, further, that Contractor shall have exercised all reasonable diligence to obtain cancellation of any outstanding commitments.

IN WITNESS WHEREOF, Reconstruction Finance Corporation and The General Tire & Rubber Company have caused this contract to be executed by their respective officers or representatives, duly authorized thereto, and their respective corporate

seals to be hereunto affixed, duly attested by their respective secretaries or assistant secretaries, to be effective as of January 1, 1949.

RECONSTRUCTION FINANCE CORPORATION

By /s/ .....
Executive Director
Office of Rubber Reserve

ATTEST:

/s/ .....

THE GENERAL TIRE & RUBBER COMPANY

By /s/ .....
President

ATTEST:

/s/ .....

APPENDIX B

Opinion of the United States District Court for the Northern District of Ohio—June 22, 1970, as Amended July 21, 1972 (349 F. Supp. 333)*

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* Pertaining to the issue of Firestone's fraud on the courts.

UNITED STATES DISTRICT COURT
Northern District of Ohio
Eastern Division

Civil No. 36,799

GENERAL TIRE & RUBBER COMPANY,
Plaintiff,

vs.

FIRESTONE TIRE & RUBBER COMPANY,
Defendant.

Civil No. C 67-206

FIRESTONE TIRE & RUBBER COMPANY,
Plaintiff,

vs.

GENERAL TIRE & RUBBER COMPANY,
Defendant.

MEMORANDUM OPINION AND ORDER

(Filed June 22, 1970. As re-edited and filed June 26, 1972 and as amended by Orders of July 5, 1972 and July 21, 1972)

Battisti, *C.J.*

This is a mammoth case involving patent claims which have affected virtually the entire rubber and tire industry of the United States and, indeed, the free world. For all practical purposes, every controversy involving United States companies, together with Dunlop of England, have been settled in this Court over the past several years. Two cases remain which comprise, as will be seen, essentially one controversy and are ripe for trial: (1) General Tire v. Firestone, Civil Action No. 36799, for patent infringement, filed in Cleveland, Ohio, Northern District of Ohio, on April 4, 1961; and (2) Firestone v. General Tire, Civil Action No. 67-206, for declaratory judgment of invalidity and non-infringement of General's patent, filed in Baltimore, District of Maryland, on March 30, 1961, and

subsequently transferred to this district under circumstances discussed below.

Each party has filed a motion to dismiss. General has moved to dismiss, alleging fraud on the part of Firestone; and Firestone has moved to dismiss, alleging patent misuse on the part of General. Each party claims its motion to be vital and dispositive of the controversy. Thus, these motions, in the order mentioned above, will be considered and resolved in this Memorandum.

I. THE FRAUD ISSUE IN CASE NO. C 67-206

General's motion to dismiss the Baltimore case is bottomed on alleged fraud by Firestone, which raises rather delicate problems of judgment. In this circumstance, it was hoped that this motion could be deferred until the end of the trial or disposed of by way of settlement of the case. However, it appears that this is a litigious situation promising to be protracted, difficult, and replete with charges and countercharges of wrongdoing. The parties have been at loggerheads for eight years, and their intransigence shows no signs of softening. After numerous pretrial conferences, it is still difficult to predict the format that the trial will take. In this situation, the Court feels it will be most beneficial to proceed to decide this motion on the completed oral arguments and the submitted briefs and appendices. It is hoped that in ruling on this matter the litigation can be molded into a reasonably coherent posture for trial.

A. Should Fraud Issue Be Re-Examined?

The threshold question is whether this Court ought to exercise its discretion to re-examine the findings made by the Baltimore court on October 17, 1966. General Tire brought a motion to dismiss this case or transfer the case to Cleveland on the basis of an alleged fraud on the part

of Firestone in commencing the suit in Baltimore. In denying the motion to dismiss or transfer, the Baltimore court made specific findings. These findings, along with other factual findings of no wrongdoing on the part of Firestone and its co-plaintiff, McCreary, included:

"Findings of Fact.

* * * * *

5. No fraud, serious or otherwise, has been practiced upon the Court by the plaintiffs.

6. There has been no effort by plaintiffs to practice fraud upon the Court." (264 F. Supp. 301)

These findings were made by an experienced judge who had conducted the Baltimore trial for more than two years. They were made on a motion similar to the one presently before this Court.

Normally "one judge does not consider a point previously decided by another judge of coordinate jurisdiction, and hence such pre-transfer rulings should ordinarily stand." 1A *Moore*, Section 0.404(8), at 4230. Nevertheless, there is compelling reason to reopen and reconsider the allegations of fraud. This is not to suggest that the doctrine of "law of the case" is ignored. The Court of Appeals for the Fourth Circuit on January 11, 1967, reversed the order of the Baltimore court denying the motion to transfer or dismiss, and issued a writ of mandamus, in the interest of judicial economy, directing the Baltimore court to dismiss or transfer the case to Cleveland. (373 F.2d 361.) The language of the opinion of the Court of Appeals essentially cancels the findings of the Baltimore Court on the fraud issue and invites a reconsideration of the allegations by this transferee court.

The opinion of the Fourth Circuit has been considered very carefully to determine what that court intended to do with the findings of the Baltimore court. There is lan-

guage which is most troublesome to interpret. The Court of Appeals said:

> "We do not feel it advisable at this stage in the lawsuit to pass on the district court's findings and conclusions with respect to General's contentions of bad faith and misrepresentation to the court. Without denigrating the importance of these issues in the ultimate assessment of costs between the parties, we think that their resolution in favor of Firestone should not have been determinative of the motion to transfer. Indeed we think the Court's preoccupation therewith caused it to overlook completely the factor which should have controlled the decision. That factor was the complete change of conditions which had taken place since the motion was originally denied. The failure resulted in an order which constituted an abuse of discretion." (373 F.2d 361 at 368)

Clearly, the Fourth Circuit's reason for ordering transfer was "the impelling need for efficiency in the administration of our court system. . . ." *Id*, at 368. It said, "We are unanimously of the opinion that the case should be transferred to the Northern District of Ohio in order to prevent an extravagantly wasteful and useless duplication of time and effort of the federal courts by the simultaneous trial of two complex and elaborate cases involving substantially the same factual issues." *Id*, at 362.

The Fourth Circuit, being expressly concerned with efficient administration, felt it advisable not to pass on the trial court's findings with respect to fraud. This does not mean they accepted these findings. Indeed, they criticized the Baltimore court for its preoccupation with these factors in deciding the motion to transfer or dismiss. The Court of Appeals *could have* passed on those findings, but it declined to do so. This avoidance was obviously intentional.

Yet the Court of Appeals saw the importance of the bad faith and misrepresentation issues and did not wish to denigrate them. What the Court of Appeals must have intended was not to nullify the findings, and also not to affirm them, but to invite the transferee court to reconsider them. Thus, it is concluded that the Fourth Circuit intended to transfer this case unbound by prior determinations.

Moreover, the intention of the Court of Appeals can be inferred from the fact that it granted an extraordinary writ of mandamus directed against the Baltimore court's order of September 16, 1966, denying the motion. The Baltimore court's findings of October 17, 1966, could only have been made to support its September 16 order. In reversing that order, there was nothing to which the findings of fact on the fraud issue could attach. It would be strange indeed for the Court of Appeals to have ordered transfer of the case with freely-floating findings coming along with it.

Firestone relies on *United States v. First National Bank and Trust Co.*, 263 F.Supp. 268 (Ky. 1967) to argue that in granting General's motion to transfer on grounds of judicial economy it must be construed that the Court of Appeals denied transfer or dismissal on the basis of fraud. In the *First National* case, the United States challenged a merger claiming violation of Sections 1 and 2 of the Sherman Act. The district court found for defendant on both counts. The Supreme Court reversed, holding that the merger violated Section 1, but noting that "in view of our conclusion . . . we do not reach the question posed under Section 2." 376 U.S. 665 at 673 (1964). Before the divestitude order, Congress enacted a statute which effectively nullified the Supreme Court ruling on Section 1. The United States thereupon attempted to reopen the case

in the district court claiming a violation of Section 2. The Court held that since the Supreme Court did not reverse on the Section 2 claims, it was precluded by the "law of the case" doctrine from reconsidering the issue. The *First National* case, while being roughly similar in context, contains factors which lessen its pointed force. The ruling appealed in the *First National* case was a final order denying relief on the merits, whereas here the relief denied in Baltimore was interim in nature and, therefore, not entitled to the same settled respect under the "law of the case" doctrine. 1B *Moore's Federal Practice*, 0.404(4). Also *First National* dealt with violations of two separate substantive provisions of the Sherman Act. In the instant case, General's motion was in fact one motion, a motion to "transfer or dismiss." The motion was ruled on as one motion. This is not a mere detail of minor significance. The Fourth Circuit had all factors before it when it reversed the Baltimore court. The Supreme Court in *First National* could have very easily considered the Section 1 controversy without touching the Section 2 questions. Finally, there is a difference in interpretation when an appellate court does "not reach the question" as in *First National*, and when it deems it inadvisable to pass on the findings at the present time, prior to transfer, as in the case here. The former leaves the lower court's determination intact; the latter may, for a wide variety of reasons, lessen the vitality of the lower court's determination. For these reasons, this Court respectfully declines to follow the rule of the *First National* case.

The final factor inducing a decision to reconsider the fraud issue is that certain testimony before the Court of Appeals reveals that the Court, and particularly Judge Haynesworth, was deeply troubled by the fraud issue. Judge Haynesworth asked Firestone's then counsel (not

the counsel now acting for Firestone in this court) to explain several statements made in the May 9, 1961, telephone conversation between Mr. Birch and Mr. McCreary, Sr. (General's Appendix, pp. 78-83). It seems clear that Judge Haynesworth was not convinced by the explanation. This testimony was taken December 5, 1966, and thus was not seen by the Baltimore court. Pondering this testimony, it seems most reasonable to conclude that the Fourth Circuit was dubious about the findings made in Baltimore; but since it had determined to transfer the case to Cleveland, it was just as well to leave it for the transferee court to re-examine and resolve the fraud issue.

B. Examination of the Allegation of Fraud.

General alleges fraud in two separate respects. A brief review of the factual background is essential to understanding the nature of the fraud allegations. On December 13, 1960, the same day that General's patent was issued, General filed suits against Goodyear Tire & Rubber Company and United States Rubber Company in Cleveland, charging infringement of General's patent. At about the same time, General sent letters to Firestone, McCreary, and a number of other companies in the industry offering licenses. Firestone contends that it felt threatened with litigation if it did not capitulate. McCreary also maintained that it was under pressure (See Firestone's brief, pp. 8-9). Determining the actual state of mind of these parties, plaintiffs in Baltimore, is unnecessary. It would seem that, at the very least, these parties were justly concerned with the Cleveland litigation; it was reasonable for them to assume that if they did not reach an accord with General, they would soon be involved in the Cleveland lawsuits. Firestone and McCreary filed a declaratory action in Baltimore on March 30, 1961; on April 4 and 6,

General filed an infringement suit against these parties in Cleveland. It is the intentions of Firestone and McCreary in filing this suit which forms the basis of General's first allegation of fraud.

General contends that Firestone began the Baltimore declaratory judgment, not in a good faith effort to adjudicate rights, but as part of a conspiracy with United States Rubber and Goodyear to set off a "backfire" on the Cleveland litigation. General says that the purpose of the declaratory judgment suit was to divide General's legal personnel between Baltimore and Cleveland in an attempt to wear down General and to delay and disrupt the Ohio litigation.

Fragmentary evidence and facts are presented by General to support the allegation that a conspiracy to obstruct the courts was intended. The evidence presented consists of communications between lawyers for Firestone and Goodyear and United States Rubber, communications between Firestone and McCreary. The key fact in the conspiracy allegation is a meeting of counsel for Firestone, Goodyear, and United States Rubber on March 16 and 17, 1961, and notes of Firestone's Baltimore counsel referring to a "backfire."

The evidence offered to show that a conspiracy to obstruct the courts was undertaken is not persuasive. Conspiracy and fraud may be proved by circumstantial evidence, *Madsen v. United States*, 165 F.2d 507 (10th Cir. 1948), but may not be proved by innuendo and unsupported inferences. General wants this Court to take the fact of meetings and communications and some rather random words, and import all manner of malicious intentions. Weighing this evidence, the Court can take only reasonable inferences; it cannot be asked to work itself into fancy plottings. Firestone has come forward with consi-

derations which reasonably explain these occurrences. For example, conferences between counsel representing parties with a common interest are an appropriate and usual practice. The Court cannot infer malice and dishonor from a set of facts when those same facts are just as susceptible to an interpretation of innocent and proper behavior. Therefore, it is found that there is insufficient evidence on which to find as a fact a conspiracy on the part of Firestone to join with others to obstruct the Cleveland litigation.

General's second contention is that Firestone perpetrated a fraud on the Baltimore District Court in that it misrepresented to the Court the status of its co-plaintiff, McCreary. General alleges that Firestone, fearing that if it began suit alone in Baltimore it was likely that the case would be transferred to Cleveland, sought out McCreary as a co-plaintiff because McCreary was more immune to transfer.

It is important to note what General has not alleged and what is not before the Court. It is not before the Court whether Firestone properly could have consulted with McCreary before filing in Baltimore, or could have encouraged McCreary to file in Baltimore. Neither is it a question whether McCreary could properly have been a co-plaintiff with Firestone in Baltimore as a completely dependent party if this had been accomplished openly. Rather, the issue is whether General has shown by clear and convincing evidence that Firestone misrepresented certain facts concerning McCreary's relationship with Firestone in order to prevent a transfer of the case to Cleveland.

The record unequivocally reveals that counsel for Firestone and McCreary did represent to the Baltimore court that McCreary was an independent party and not a

"little patsy" of Firestone's; that he told the Baltimore court at the July 6, 1961, hearing on the first motion to transfer that: "He (McCreary) can, perhaps, derive some benefit from his association with Firestone, but he comes here independently, and not as Firestone's agent or cat's paw, and I think that should be clearly understood." (General's Appendix, pp. 62-4). An affidavit was filed on June 30, 1961, asserting McCreary was "wholly independent of Firestone". (Appendix, p. 57). These are but some of several instances of Firestone's assertions. The record is also clear that Firestone and McCreary did represent to the Court that there was no written or oral agreement between them relating to the participation of McCreary in the conduct of the litigation (General's Appendix, pp. 65, 92, 133).

The Court has been persuaded on the evidence presented by General that these representations were false and therefore constituted a fraud on the Court. The independent status of McCreary is severely undermined by clear and convincing evidence. The fact that McCreary and Firestone shared the same counsel Firestone's counsel, the statement by McCreary that he would be guided by Firestone's counsel 100%, and that McCreary would be as active as counsel wanted them to be (General's Appendix, pp. 30-31), are indicative of a lack of independent status. Most compelling is the dictaphone belt recording of a conversation between Mr. McCreary and Mr. Birch on May 9, 1961, wherein a billing arrangement was agreed on whereby McCreary would pay one per cent of the cost of the litigation. So, the colloquy between counsel and Judge Haynesworth, wherein counsel tried to explain certain language, such as, "I don't want to put anything in the mail, and I don't want to talk about it too much, for obvious reasons"—clearly leads to the inference that there was an attempt to conceal something of importance in

the May 9, 1961, call. It is equally clear from the recording that Firestone's counsel was taking steps, through a billing arrangement, to obviate the charge that McCreary was a "little patsy." Marshalling all this evidence, the Court is convinced that the one per cent billing arrangement was in fact a sham perpetrated by Firestone on the Baltimore court.

C. Remedies

In its motion to dismiss, General argued that a finding of fraud in the transferred Baltimore case should preclude Firestone from contesting the validity of General's patents, as well as dismissing the declaratory judgment action. This would leave for trial only the infringement issue. After much consideration, the Court declines to adopt this course.

Counsel for General Tire conceded in oral argument that there exists no authority whereby the fraud of an alleged infringer, in and of itself, caused a patent held by an adverse party to be declared valid, or operated to estop such a wrongdoer from contesting the validity of a patent. Firestone has cited several cases which expressly declined to validate a patent on the grounds of fraud or unclean hands. There is a strong public interest which encourages a hearing of defenses to patents; the monopoly aspects of patents demand that their validity be scrutinized. *Heath v. Frankel,* 153 F.2d 369 (9th Cir. 1946); *Plechaty Co. v. Heckett Engr., Inc.,* 145 F.Supp. 805 at 806 (N.D. Ohio 1956); *Bulldog Elect. Prods. Co. v. Westinghouse Elect. Corp.,* 162 F.2d 994 (2d Cir. 1947); *Trott v. Cullen,* 86 F.2d 141 (10th Cir. 1936).

General attempts to meet the authorities by contending that the public interest has in fact been adequately protected in this case. General emphasizes that the whole

tire industry, save Firestone, has settled with General and taken licenses. General further points out that Judge Holtzoff already held a hearing with respect to the patent at issue. But the issue before Judge Holtzoff was essentially to determine whether the patent should issue. Therefore, it cannot be construed as a full-blown hearing on the validity of the patent. Likewise, the fact that the rest of the tire industry has elected to take out licenses instead of contesting the validity of General's patent does not remove the public interest in contesting patent monopolies. On the contrary, the public interest must be explored now, or it never will be. In conclusion, the Court declines to hold General's patent valid on the basis of Firestone's fraud.

While General's patent may not be rendered valid by virtue of Firestone's fraud, General's further contention that the Baltimore case should be dismissed has considerable merit. The district court has discretion to exercise jurisdiction in a declaratory judgment action. Factors which may be considered are: (1) whether hearing the declaratory judgment action would eliminate uncertainty between the parties, (2) whether the plaintiff's legal rights would be adequately protected if it were not heard, and (3) equitable defenses including the conduct of the parties. 3 Baron and Holtzoff, *Federal Practice and Procedure* 1266 (1958); *Abbott Laboratories v. Gardner*, 387 U.S. 136 (1966).

The Court will consider Firestone's defenses in the Cleveland case. Therefore, any uncertainty will be disposed of therein, and Firestone will be adequately protected because it retains the right to contest the validity of General's patent and to contest infringement. The inequitable conduct of Firestone in misrepresenting the status of McCreary in Baltimore is a clear-cut case of unclean hands. For the foregoing reasons, the Baltimore

case is ordered dismissed. See *Lumberman's Mutual Casualty Co. v. Quick*, 257 F.Supp. 252 (1966). All defenses, and all litigable issues therein, will be consolidated into the Cleveland case. The parties may enter into the Cleveland case the relevant portions of the Baltimore record. The parties may agree on the most expeditious means of making the Cleveland record.

The Court deems it to be the wisest course to defer ruling on the matter of costs, attorneys' fees, and punitive damages until such time in the future as it will be appropriate. It goes without saying that the Court considers the fraud which it has found to be extremely serious. The question of costs is, however, a very delicate area. To go into it now would serve only to further exasperate the feelings of the parties. It must be remembered that the Court finds fraud in the misrepresentation of the status of a party; the facts are insufficient to find a conspiracy to obstruct justice.

II. PATENT MISUSE, CASE NO. 36799

Firestone has moved to dismiss, asserting that General is guilty of patent misuse and, therefore, is not entitled to relief in the courts from patent infringement and its complaint must be dismissed.

Turning to the first alleged misuse, Firestone charges that in its settlement agreements with Goodyear (in paragraph 6[b], Goodrich (in paragraph 5[b]), and Uniroyal (in paragraph 5[b]), General authorizes each of its licenses to extend immunity under General's patent. For example, paragraph 6(b) of the Settlement Agreement with Goodyear reads, in pertinent part, as follows:

> "*General hereby covenants and agrees that it will not assert anywhere any claim* . . . against Goodyear,

its suppliers, customers and users of its products *for infringement . . . of any patent or patent application in the General Tire Patent Rights; and, furthermore,* General hereby grants to Goodyear a non-exclusive non-transferable . . . world-wide right and license under the General Tire Patent Rights to make, use and sell products embodying or made by the inventions defined in the General Tire Patent Rights. The provisions of this Article 6(b) shall not apply to third party users . . . of Goodyear-made synthetic rubber-oil blends . . . to the extent, but only to the extent, that they use such Goodyear-made blends in the manufacture of . . . tires, but after four (4) years from the date of this agreement *the provisions of this Article 6(b) shall be applicable to such users not licensed under the General Tire Patent Rights other than those against whom a suit by General is pending for infringement of the General Tire Patent Rights, provided Goodyear furnishes appropriate written notice to said third party users . . . advising that immunity is being extended under the General Tire Patent Rights and that a royalty is included in the sales price to said third party users for such immunity.*"

The purpose and effect of this language is not without ambiguity. Firestone argues that this licensing provision extends the monopoly of General's patent to purchases of unpatented goods. General's licensees will have a competitive advantage, accruing from the leverage of General's immunity, over unlicensed competition (notably Firestone) in selling unpatented Oil Extended Rubber (OER).

General's reply is to point out that the provision does not require Goodyear and the others to grant any immunities, but merely gives them an option. This provision

became operative on February 9, 1970. To date, there is no indication that this option has been exercised. While disputing whether granting this immunity would violate the antitrust laws, General insists that even if the Court assumes they are contrary to law, it ought not to assume that the licensees will act contrary to law and exercise the option.

This response by General in part misses the point and in part traverses the allegation. To establish patent misuse, it is enough to show the existence of a restrictive agreement which tends to suppress competition in unpatented goods. *Morton Salt v. Suppinger*, 314 U.S. 488, 62 S.Ct. 402 (1942). So it is not enough to say that the provision remains inoperative. Such an agreement apparently exists; it is an open question whether there is in fact a suppression of competition (see below); and, according to the case law, it is not necessary for a court to find an actual wrongful practice.

On the other hand, however, the types of licensing agreements which the courts have treated as patent misuse are in the nature of tying arrangements which require the purchase of unpatented goods for use with the patented apparatus or goods. *Mercoid Corp. v. Mid-Continental Investment Co.*, 320 U.S. 661, 64 S.Ct. 268 (1944); *Morton Salt, supra*; *B. B. Chemical Co. v. Ellis*, 314 U.S. 495, 62 S.Ct. 406 (1942); *Leitch Mfg. Co. v. Barber Co.*, 320 U.S. 458, 58 S.Ct. 288 (1938); *Carbice Corp. v. American Patents Develop. Corp.*, 283 U.S. 27, 57 S.Ct. 334 (1931). This factor of non-requirement does seriously forestall the Court from inferring a tendency to suppress competition. It has been said that where the patentee never, at any time, insisted upon a construction of his license agreements by which a broader monopoly would be acquired, the patentee could not be deemed guilty of

misuse. *Carter Prods. v. Colgate-Palmolive*, 164 F.Supp. 503 (1958).

Upon a careful reading of all of the cases relied upon by Firestone, the Court was able to discern several critical factors applicable to the doctrine of patent misuse which are not present in the situation in the instant case. In *Mercoid, Leitch, Carbice,* and *B. B. Chemical,* for example, patentees are denied all relief against infringement where the patentee uses his patent monopoly to secure a limited monopoly on unpatented goods. There are two important aspects to this: (1) the patentee is condemned for using his patent to *control* the manufacture, use or sale of unpatented goods, and (2) the extension of the monopoly is geared to the aspect of benefit inuring to the *patentee.* In this respect, one usually finds that the unpatented goods involved were being sold by the patentee, in conjunction with his patented product. *Cf. Landis Mach. Co. v. Chaso Tool Co.,* 141 F.2d 800, 803 (6th Cir. 1944); *Lincoln Elect. Co. v. Linde Air Prods.,* 171 F.2d 223 (6th Cir. 1948).

In this case, General has not limited its licenses by any condition that General's OER be purchased, nor is a more favorable rate offered if purchasers buy such rubber from General or one of its licensees. General does not attempt, with this provision, to use the patent to aid its sales of OER. And General does not control the manufacture, sale or use of unpatented goods.

Firestone argues that the licensing arrangement restrains trade and extends the monopoly of General's patent in that independent, unlicensed competitors cannot offer this grant of immunity. Firestone concedes that if independent licenses were available on the same terms as are the licenses granted with the purchase of unpatented goods, there is no misuse. This is so, because un-

licensed competitors of the patentee in the sale of unpatented goods are not disadvantaged. The alleged tying licenses do not restrain trade because all prospective buyers can then purchase at the same royalty.

Firestone cites cases in which disparities in royalty systems are declared to be patent misuse. *Barber Asphalt Corp.* v. *LaFera Grecco Contracting Co.*, 116 F.2d 211 (1940); *Dehydrators Ltd. v. Petrolite Corp.*, 117 F.2d 183 (1941). In these cases, the competitor is so disadvantaged that he is forced to succumb to the extension of monopoly. General has pointed out that it offered lump-sum licenses to the entire industry on an equal basis. If it is true that equivalent licensees cannot be achieved because the terms of the settlement agreement provide for lump-sum royalties without apportionment, then General's response does little to rectify this defect. However, more important is the question whether this arrangement restrains competition as contended. In Firestone's cases, such restraint was actually found; and, again, the patentee's product was being forced on the purchaser. In the instant case, no action has been taken by General's licensees which has the effect of placing Firestone at a competitive disadvantage. Mere price advantage which a patent licensee enjoys and which does not involve monopoly of a substantial portion of commerce is not illegal. *Martin v. Ford Alexander*, 160 F.Supp. 670 (1958).

The position of Firestone is that the Court's function is to look for anything in the settlement agreements which tends to restrain trade and expand the monopoly, and then find wrongdoing. On the contrary, the Court faces a much more subtle, complex and troubling task. The parties have invoked the equity jurisdiction of the Court, and equitable remedies must be very carefully fashioned. The legions of cases cited by Firestone are clear in that misuse, once found, must be condemned. This task is

surely mechanical. The difficult aspect of this problem is to decide whether there has been a patent misuse, and if so, whether it is serious enough to require condemnation. In this regard, the Court is compelled to a further examination of the case law.

Mercoid Corp. v. Mid-Continent Invest. Co., supra, does not support Firestone's position. It is clearly distinguishable. In *Mercoid,* the Court found misuse of the patent because the patentee was trying to control competition in the sale of an unpatented part. The crux of that holding is that misuse involves finding a restraint in free competition on items outside the scope of the patent grant.

The fact that royalties are paid on unpatented goods is not the test of misuse. *Automatic Radio Mfg. Co. v. Hazeltine Research,* 339 U.S. 827, 833, 70 S.Ct. 894 (1950) teaches that the test for patent misuse is the purpose and effect of the royalty provision. If the purpose is to enlarge the patent monopoly to cover unpatented goods, as in *Mercoid,* it is to be condemned. Where the agreement does not, and was not intended to, result in extension of patent monopoly, as in *Hazeltine,* it is permissible. In *Hazeltine,* the Court found the purpose of the provision was to establish a reasonable royalty base.

In determining when a patentee has committed patent misuse, "it is necessary to consider whether the exercise of the patent monopoly will result in a limited monopoly in an unpatented commodity *as a practical matter,* and whether the patentee *seeks to derive profit, not from the invention itself, but from unpatented supplies used therein. . . .*" *Cardox Corp. v. Armstrong Coalbreak Co.,* 194 F.2d 376, *cert. den.,* 343 U.S. 979, 72 S.Ct. 1076 (1952); *Universal Sewer Pipe Corp. v. General Constr. Co.,* 42 F. Supp. 132 (D.C.Ohio 1942). It is imperative that the Court

find an actual realistic effect upon competition. *International Salt Co., Inc. v. United States,* 332 U.S. 392, 398, 68 S.Ct. 12 (1947). The Court may properly inquire into the alleged misuser's motives behind the arrangement, because "a purpose to expand the scope of monopoly must be found." *Stearns v. Timken & Rasor,* 252 F.2d 589 (1958); *Martin v. Ford Alexander, supra; Automatic Radio Mfg. Co. v. Hazeltine Research, Inc., supra.*

In general, agreements which limit licenses are not illegal per se, *United States v. Birdsboro Steel,* 139 F.Supp. 244 (1956); nor are refusals to grant licenses, *United States v. L. P. Caulk Co.,* 126 F.Supp. 693 (1955); nor to select or reject licenses and to prefer one over others in patentee's discretion, *United States v. DuPont,* 118 F.Supp. 41, 351 U.S. 377 (1954); nor does the mere fact that a patentee combines an unpatented article with his patented article and sells the unit as a whole amount to misuse per se, *Sterns v. Timken & Rasor, supra.*

The fact that a license is given to use a patented product with the purchase of an unpatented product is not of itself patent misuse. *Sola Elect. Co. v. General Electric,* 146 F.Supp. 625 (1956). Title 35, U.S.C., §271(c) and (d) have been said to change the law of *Mercoid* in this respect. *Id.,* at 647. There must be a showing that the patent monopoly has been expanded or used to restrain trade. *Calhoun v. United States,* 339 F.2d 665 (1964).

To invoke the doctrine of patent misuse, the challenger must establish that the patentee used the patent in an attempt to monopolize the sale of unpatented goods or to gain some market or other advantage over other ccompetitors. *Automatic Radio Mfg. v. Hazeltine Research, Inc., supra; Technical Tape Corp. v. Minnesota Mining & Mfg. Co.,* 143 F.Supp. 429 (1956). The doctrine

of patent misuse is aimed at agreements which use patents to restrain trade or extend the monopoly of the patent. The Court cannot take a surface view of the licensing arrangement and automatically condemn it. There are valid reasons why General may have this provision. Merely to see it in words is not to see it extending monopoly and restraining trade. Firestone charges that this provision is a tying arrangement. But economic coercion and restraint in free competition in unpatented goods are necessary corollaries to tying arrangements. *Valmont Industries v. Yuma Mfg. Co.*, 296 F.Supp. 1291 at 1295 (1969). There have been no such conditions imposed here. There is no evidence of coercion, profit motive, or desire to expand monopoly. In *Valmont*, the district court found no requirements, either express or implied, for the purchase of unpatented goods, and found no patent misuse. The same is true here. This Court cannot find any evidence that General was trying to extend its patent monopoly nor tending to suppress free competition in unpatented goods with the challenged licensing provision. Therefore, it cannot be found that the licensing provisions in question constitute patent misuse.

The second argument advanced in Firestone's motion to dismiss is that the terms of General's settlement agreements so restrain its independence to enforce its patent as to constitute unlawful restraint of trade and, hence, patent misuse. Firestone points to a number of provisions in these agreements—the "wagering" clause, the "favored nations" clauses, provisions against giving financial aid to General's opponents, etc.—and contends that these constitute an agreement in restraint of trade. The Court will not here examine at length the contentions with regard to construction and interpretation of these clauses; although the provisions are complex, the aim of these provisions is much too clear for argument.

There is a provision that if General fails in its lawsuit against Firestone, General will repay part of the royalty collected from its licensees to Goodyear, Goodrich, and Uniroyal. There is a provision that if General settles with Firestone, these licensees will be given the benefit of any terms in the settlement agreement with Firestone more favorable than those presently accorded the licensees. Firestone argues that by these terms, General has gambled on the outcome of its suit with Firestone; and because of the high stakes, General has voluntarily placed itself in a position where it must litigate "to the bitter end," and, consequently, it has restricted its independence in dealing with litigation under its patent.

The sinister implications which Firestone would have this Court draw from these provisions are specious and nonexistent. The Court sees the "swing" provision as an innocuous attempt to provide for a refund to the licensees should General's patent be held invalid. The provision to accord most favorable terms is nothing more than a strategy to encourage early settlements; it assures early settlers that those following will not benefit from prolonging the struggle. In sum, the provisions in these settlement agreements are legitimate and lawful efforts on the part of the patentee and its licensees to settle their controversies. The Court discerns no conspiracy, no restraint of trade.

Consequently, General is not guilty of any misuse of its patent in these provisions.

CONCLUSION

Firestone's motion to dismiss is overruled. The Court finds that the questioned provisions in the settlement agreements between General and its licensees fail to form

sufficient evidence of patent misuse. Despite Firestone's ingenious arguments, the fair and reasonable interpretations of these settlement provisions admit of no conclusion that General was attempting to extend its monopoly or conspiring to restrict its independence.

The Court has now considered all motions which have prevented the commencement of the trial of this case. It is now ripe for trial. The Court would have liked to find some valid grounds to dismiss in these motions, because the litigation appears to be endless. It appears that such solution is not to be found in motions, but in the reasonable attitude of the parties. This controversy should be settled. In lieu of this happy consequence, the trial shall commence on September 28, 1970.

It is so ordered.

/s/ Frank J. Battisti
Chief Judge

APPENDIX C

Opinion, Findings, and Order of the United States District Court for the Northern District of Ohio—July 21, 1972 (349 F. Supp. 345; 351 F. Supp. 872)*

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* Pertaining to the patent and license issues.

UNITED STATES DISTRICT COURT
Northern District of Ohio
Eastern Division

Civil No. 36,799

GENERAL TIRE & RUBBER COMPANY,
Plaintiff,

vs.

FIRESTONE TIRE & RUBBER COMPANY,
Defendant.

Civil No. C 67-206

FIRESTONE TIRE & RUBBER COMPANY,
Plaintiff,

vs.

GENERAL TIRE & RUBBER COMPANY,
Defendant.

MEMORANDUM OPINION AND ORDER

(Filed June 26, 1972)

Battisti, *C.J.*

This is a rather complex patent case, perhaps the most protracted in existence anywhere in the world.[1] At issue is a patent on the invention of tire treads and tread stock made from very tough synthetic rubber to which large amounts of oil have been added to increase the yield and to improve processability. Since 1950 it has been known in the trade as oil-extended rubber (OER). The issues in this case are set out in Findings 13-16. Three representative stocks (Stock A, Blend 2, and Blend 5) are charged with infringement of ten representative claims (1, 3-5, 7, 13, 14, 17-19, and 22). Firestone has defended on the grounds of non-infringement, invalidity, license, and unenforceability. As this opinion and the accompanying findings of fact and conclusions of law indicate, this Court has rejected each and every one of Firestone's de-

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1) This controversy arose more than two decades ago. The reasons for this protraction are not to be found in any dilatory practices by counsel, whose performance throughout has been largely exemplary; rather they lie in the intractability of the parties themselves, in the fraud practiced by Firestone in Baltimore, and in the depth to which various issues have had to be examined. As an indication of the mammoth size of this case, the transcript alone runs to 44,773 pages, of which 38,299 pages were inherited from the trial in Baltimore; to this must be added, as well, over 100,000 pages of depositions and evidence. In such a case, it is obvious that it would be unwise for the Court to depart from the exposition and development of the issues formulated by the parties themselves in their briefs. The Court has been persuaded by the logic of General's arguments presented in its brief and by the cogent answers given there to Firestone's defenses; accordingly, this opinion will be seen to follow broadly the format of that brief. It need hardly be added, however, that every case cited in both briefs has been carefully examined by the Court, and that most of them were discussed thoroughly by counsel during the week of final arguments.

fenses; and judgment will be entered in favor of the General Tire and Rubber Company.

Findings 17-21 set out the history of the patent in the Patent Office and the proceedings before Judge Holtzoff. *General Tire & Rubber Co. et al. v. Watson*, 184 F. Supp. 344 (D. D.C. 1960). This patent was originally allowed by the Patent Office examiner whose area of expertise was directly related to the subject matter of the invention, *viz*, pneumatic tire treads. Invention was found by Judge Holtzoff after a full adversary attack on the invention, not only by the Patent Office but also what appears to be an unprecedented attack by the Department of Justice.

A statutory presumption of validity attaches to a patent upon its issuance and the burden of establishing invalidity is imposed upon the party attacking it. It is Firestone's burden to overcome this presumption by clear and convincing evidence, and every reasonable doubt should be resolved in favor of a finding of validity. 35 USC §282; *Cantrell v. Wallich*, 117 US 689-695-6 (1885); *The Barbed Wire Patent*, 143 US 275, 285 (1891); *Mumm v. Decker & Sons*, 301 US 168, 171 (1937); *Frohock-Stewart, Inc. v. Reed-Cromex Corp.*, 254 F.Supp. 120, 122-3 (N.D. Ohio 1966); *Simplicity Mfg. Co. v. Quick Mfg., Inc.*, 355 F.2d 1012, 1014 (6th Cir. 1966); *H. K. Porter Co., Inc. v. Goodyear Tire & Rubber Co.*, 163 USPQ 106, 114 (N.D. Ohio 1969), *aff'd* 168 USPQ 449 (6th Cir. 1971); *Forestek Plating & Mfg. Co. v. Knapp-Monarch Co.*, 106 F.2d 554, 557 (6th Cir. 1939).

This presumption is strengthened by the fact that invention was found after extended prosecution in the Patent Office and thereafter a full federal court adversary proceeding. *Hildreth v. Mastoras*, 257 US 27, 32 (1921); *Cincinnati Butchers' Supply Co. v. Walker Bin Co.*, 230

F. 453, 454 (6th Cir. 1916); *Cold Metal Process Co. v. Republic Steel Corp.*, 233 F.2d 828, 837 (6th Cir. 1956), *cert. den.*, 352 US 891 (1956); *United States Plywood Corp. v. General Plywood Corp.*, 230 F.Supp. 831, 837 (W.D. Ky. 1964), *aff'd*, 370 F.2d 500 (6th Cir. 1966), *cert. den.*, 389 US 820 (1967). Judge Holtzoff heard many of the same witnesses, considered the primary prior art references, and the main prior use defenses presented here by Firestone. None of this prior art was found to be an anticipation or to make the invention obvious.

Findings 22-62 describe the art to which the invention relates. They describe the technology and terminology necessary to the understanding of the invention and the prior art. They also describe the man who is skilled in the relevant art and the state of the art at the time of the invention. In short, they provide the proper starting point for the resolution of technical issues and the determination of invention. *Graham v. John Deere Co.*, 383 US 1, 17 (1966); *American Stove v. Cleveland Foundry Co.*, 158 F. 978, 984-5 (6th Cir. 1908); *Kohn v. Eimer*, 265 F. 900, 902-3 (2d Cir. 1920); *Nickerson v. Bearfoot Sole Co.*, 311 F.2d 858, 869-70 (6th Cir. 1962), *cert. den.*, 375 US 815 (1963); *Solomon v. Kepner*, 99 F.Supp. 221, 226 (D. Pa. 1951), *aff'd* 195 F.2d 387 (3rd Cir. 1951), 344 US 13 (1952); *Minnesota Mining & Mfg. Co. v. Carborundum Co.*, 155 F.2d 746, 749 (3rd Cir. 1946).

Findings 63-79 set out the circumstances surrounding the invention and its advance over the prior art. These circumstances not only contradict Firestone's allegations that the invention was derived from others and falsely presented to the Patent Office, but are themselves evidence of unobviousness. They have provided valuable assistance in the determination of invention. Judge Hand expressed this fact in *Safety Car Heating & Lighting Co. v. General Electric Co.*, 155 F.2d 937, 939 (2d Cir. 1946):

> "Substantially all inventions are for the combination of old elements; what counts is the selection, out of all their possible permutations, of that new combination which will be serviceable. No objective standard is practicable. . . . Courts made up of laymen as they must be are likely either to underrate, or to overrate, the difficulties in making new and profitable discoveries in fields with which they cannot be familiar; and so far as it is available, they had best appraise the originality involved by the circumstances which preceded, attended and succeeded the appearance of the invention."

Judge Holtzoff was of this view. While he recognized that the manner in which an invention is made is not determinative of patentability (35 USC §103), he stated, at 184 F.Supp. at 347:

> "The fact, however, that the discovery was made accidentally by a person skilled in the art, while others had been working to find other ways and means to achieve the same objective, namely, to increase the supply of usable rubber, would seem, to some extent at least, to negative the contention that the invention was obvious."

The reaction of the industry to the invention is well known. Their reaction strengthened the statutory presumption of validity and negated Firestone's allegations that the invention was obvious and that its product was inferior to the prior art. *Eibel Process Co. v. Minnesota & Ontario Paper Co.*, 261 US 45, 56 (1922); *Forestek Plating & Mfg. Co. v. Knapp-Monarch Co.*, 106 F.2d 554, 558 (6th Cir. 1939); *Ekco Products Co. v. Chicago Metallic Mfg. Co.*, 321 F.2d 550, 553-4 (7th Cir. 1963), *cert. den.*, 375 US 970 (1964). Indeed, Firestone was among the

leaders in first expressing doubt, then extolling the surprising virtues of the invention. As Mr. Justice Graham said in his learned opinion in the English case (GX 2520, p. 60):

> "It is indeed unusual, if not unprecedented, to find in a patent action such a tribute from a defendant to the excellence of a plaintiff's product and process."

As in *United States v. Adams*, 383 US 39 (1966), here we have the classic indicia of invention: (a) a novel combination of elements, each old in itself, but combined in a manner counter to and discouraged by the teachings of the art, to produce a surprising result; (b) initial disbelief and skepticism by those skilled in the art; (c) followed by universal adoption of the invention, revolutionizing the art and producing great economy.

The claimed invention against which the prior art is to be measured is set out in Findings 91-96. *Graham v. John Deere Co.*, 383 US 1, 17 (1966).

While the claims of a patent limit the invention, and the specification cannot be utilized to expand the patent monopoly, it is fundamental that the claims of a patent are to be construed in light of the specification and both are to be read with a view to ascertaining the invention. *United States v. Adams*, 383 US 39, 49 (1966).

The claimed invention is a product (tire treads and tread stock). It consists of the novel, interacting combination of elements. The controlling legal principles are straightforward:

> Even if the elements of a combination are individually old, a combination constitutes a patentable invention when it is novel, the elements have a new or different interdependent functional and coopera-

tive relationship, and the bringing together of the elements as taught by the patent in suit was unobvious in the light of the prior art. *United States v. Adams*, 383 US 39, 51-52 (1966); *Maytag Co. v. Murray Corp. of America*, 318 F.2d 79, 81 (6th Cir. 1963). A new combination of old elements whereby an unexpected result is obtained (or even an old result is obtained in a more economical or efficient way) constitutes patentable invention. *Webster Loom Co. v. Higgins*, 195 US 580, 591 (1882); *Diamond Rubber Co. v. Consol. Rubber Tire Co.*, 220 US 428, 443 (1911); *National Latex Products Co. v. Sun Rubber Co.*, 274 F.2d 224, 239 (6th Cir. 1959), *cert. den.*, 362 US 989 (1960); *Firestone v. Aluminum Co. of America*, 285 F.2d 928, 930 (6th Cir. 1960); *FMC Corp. v. F. E. Meyers & Bro. Co.*, 384 F.2d 4, 8-9 (6th Cir. 1967), *cert. den.*, 390 US 988 (1968); *Great Lakes Equip. Co. v. Fluid Systems, Inc.*, 217 F.2d 613, 617 (6th Cir. 1954).

As will be seen, all of Firestone's defenses cannot stand the light of day. Even more so is Firestone's argument to the effect that there is no invention. Firestone urges that there is no invention because an unpatented but new product (OER masterbatch) was used in known and exclusively used processes to obtain a known end product (tire treads and tire tread stock). This argument misses the point by a mile and is particularly specious, because no one knew that the end product—OER tire treads and tire tread stock—could be utilized feasibly and would result in a better synthetic rubber tire.[1a] In this

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1a) Firestone admitted in final argument that the government, pursuant to the Rubber Reserve Act, did not intend to enter the tire business. Its interest extended only to the making of synthetic rubber masterbatches, leaving the building of tires, that is to say, subsequent compounding, to the tire manufacturing industry. Upon entering World War II, the natural rubber supply to the United States was cut off. President Roosevelt sought to assure that the United States would never again be compelled to rely on an external rubber supply, and thus the Rubber Reserve Act was enacted. See text at footnote 4, infra.

connection and for the technology involved, see Finding 95 which articulates Claim 14 defining the tire tread composition.

There is no real question of infringement. Firestone's defenses in this regard amount to no more than nit-picking semantics. See *Robertson Rock Bit Co., Inc. v. Hughes Tool Co.*, 176 F.2d 783, 786 (5th Cir. 1949).

Firestone says it does not infringe because the Mooney of the rubber it used was not shown by analysis of a vulcanized tire tread. There is no basis in law for this assertion and, in fact, the Mooney cannot be directly shown by such analysis. General has proven directly, beyond doubt or even challenge, the Mooney of the rubber used by Firestone in making its infringing products. It is unreasonable to read the claims otherwise.

Firestone says that the rubber in its FR-S 184 has no raw Mooney because at all times prior to the addition of oil to the rubber it is in the form of a latex upon which no Mooney can be measured. With all respect, this argument is specious. Firestone regularly coagulates this latex and measures the Mooney of the coagulum as a part of its production controls for FR-S 184. Dr. Semon referred to the Mooney of latices in his testimony meaning, as he pointed out, the Mooney of the polymer when coagulated. This is obviously the intent of the claims.

Firestone says Dr. Semon's tests showed that its FR-S 184 did not meet the polymer characterization test set out in claim one.[2] This argument hardly need be discussed. Semon's preliminary tests using HAF black and a hydrocarbon oil showed the polymer of FR-S 184 to be

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2) Claim one characterizes the toughness of the polymer by a test which involves mixing 100 parts of the polymer with 65 parts of a "high abrasion furnace carbon black" and 30 parts of a "hydrocarbon oil." If the mixture has a compound Mooney over 60 the toughness test is met.

well above the 60 Mooney limit set out in claim one. Even though Firestone took care not to repeat precisely any of the infringement tests performed by General, the net effect of Semon's preliminary tests was to confirm infringement.

Firestone did not present any of Semon's preliminary tests to the Court. Those it did present were designed for failure, not fairness. Semon used oils that were not recommended for use in tread compounds and which he had never heard of as being so used. His blacks were not of the type called for in the claim one test. The tests, using high and low structure blacks which were not in existence until after 1960, were excluded at the trial. Those using high modulus furnace black are not in compliance with the claim one requirement that the black be high abrasion furnace black and are therefore irrelevant.

Firestone says it does not infringe Claims 18, 19, or 22 because they call for the rubber to be substantially unmasticated or unbrokendown. Again Firestone relies on semantics. It is clear from the patent that some working is necessary in order to incorporate the carbon black and other ingredients, but no more than was used in the prior art. In other words, according to this claim language and the invention, there should be and need be no excessive mastication or breakdown such as was used by the Germans to degrade the rubber to the point of processability.

Conspicuously, Firestone makes no attack on General's direct proof of the raw Mooney, oil content, black content, extrusion Mooney values, or mixing procedures used by Firestone. In most instances, these facts have been agreed to by Firestone. They are the facts which are material to and constitute proof of infringement.

The parties are at issue over the status of some 51 alleged prior art references as prior printed publications.

The first category of disputed references consists of documents which originated under the government synthetic rubber program: the CD Reports, AU Reports, Technical Committee Reports, and Tire Test Reports. The AU Reports may be disposed of summarily. They originated in the government laboratories at Akron University and were found in the files of Rubber Reserve after this suit began. There is no showing that they were distributed, even to the other participants in the government synthetic rubber program. So far as has been shown, they were merely internal government papers, clearly not publications.

The CD Reports, Technical Committee Reports, and Tire Test Reports may be considered together. They were distributed to a limited number of named individuals participating in the government program, according to fixed distribution lists. They were not available to the general public, but were subject to secrecy agreements between Rubber Reserve and the participants in the rubber program.

A distribution to a limited group with an injunction to secrecy is not publication within the meaning of 35 USC §102. In *Badowski v. United States*, 164 F.Supp. 252, 255 (Ct. Claims 1958), the Court held that:

> "The statutory language, 'printed publication' implies that numerous copies were printed and made accessible to the general public."

In *Ex parte Suozzi*, 125 USPQ 445, 446-447 (P. O. Bd. App. 1959), it was held that a government report restricted to use for governmental purposes was not a disclosure to the public and therefore not a printed publication under 35 USC §102:

> "We will first refer to the aforementioned distribution list appearing on the last page of the reference

report. From the tenor of said list, each of the entities named thereon would appear to be a regular governmental installation, or an individual in regular governmental service, either military or civilian, named as a recipient of a copy of the report because of some relation of the subject matter of the latter to work of said entity. Hence, it seems clear to us that the report is one of an internal organizational character and that each of the aforesaid entities, in receiving a copy of the report, would be doing so in an official capacity and not as a part or member of the general public. On this basis we see no establishment of publication for the reference report merely by the distribution thereof, in and of itself, denoted on said list. . . .

"The distribution list of said report, and particularly when read together with the notation in question, shows that at the time of its formulation . . . said report was intended for and given but limited distribution, and this as we have pointed out only of an official nature. In the light of these circumstances, we can resonably conclude only that the 'other requesters' of the involved notation were likewise to have some official capacity for access to a copy of the report."

In *Dow Chemical Co. v. Williams Brothers Well Treating Corp.*, 81 F.2d 495, 499 (10th Cir. 1936), the Court held:

"The proof is convincing that this was a private report to one entitled to the services of the Institute; it was never published and is not therefore a 'printed publication.' See *United Chromium v. General Motors Corp.*, 11 F.Supp. 694 (D.C. Conn.), in which the authorities are gathered."

See also, *Rayonier Inc. v. Georgia-Pacific Corp.*, 156 USPQ 110, 126 (W.D. Wash. 1967).

Documents which are the subject of secrecy agreements and classified as "Restricted" cannot be anticipatory prior art. In *Ex parte Harris*, 79 USPQ 439, 440 (1948), the Commissioner of Patents considered the status of reports circulated among participants in a wartime government-sponsored research program, and subsequently released to the public. He stated:

> "It is immaterial that copies of the report were in the hands of members of the group at the time of declassification, the test is whether this material was freely available to the public at large immediately following the decision to declassify. . . ."

In *Harris*, as here, the participants in a government-sponsored research program (there penicillin, here rubber) were subject to contractual obligations against divulging technical information generated under the program to the general public. There is no showing here that these contractual obligations terminated prior to the filing of General's patent application.

None of the CD, Tire Test, or Technical Committee Reports meets the legal standards required of printed publications. None is prior art under 35 USC §102.

The second classification of disputed references is the microfilms of captured German documents. The first question is whether they meet the statutory requirement that a reference be "printed" (35 USC §102). The leading case, *Application of Tenney*, 254 F.2d 619, 627 (C.C.P.A. 1958), has answered the question in the negative; a microfilm is not printed and not prior art:

> "While microfilming furnishes a means of multiplying copies, there is no probability, from a mere showing that a microfilm copy of a disclosure has been produced, that the disclosure has achieved wide circu-

lation and that, therefore, the public has knowledge of it. The nature of present day microfilm reproduction differs from normal printing methods. Though one would be more likely than not to produce a number of copies of printed material, one producing an item by microfilming would be as apt to make one copy as many. In the case of printing, unless a number of copies were produced, a waste of time, labor and materials would result; present day microfilming methods, on the other hand, are as well designed to produce one microfilm as well as many without waste.

"It is no doubt true that the present law is anomalous, as evidenced by our conclusion that the microfilm is not 'printed.' A foreign patent file, laid open for public inspection, is not a printed publication, because typewritten, while a printed publication, available to the public only in a Southern Rhodesian library, would be. The former is obviously more likely to reach the eyes of the American public than the latter. It is obvious, however, that unless we are to rewrite 35 USC §102(b) for Congress, this must be the result reached. Our job is to interpret the law, not to make it."

Not only are Firestone's microfilm references not "printed," but there is no evidence of their publication. Publication is not shown by mere evidence of ability to mass produce. *Browning Manufacture Co. v. Bros., Inc.*, 126 USPQ 499, 503 (D. Minn. 1960). Directly in point are decisions which hold that German GM's (Gebrauchsmustern) are not publications although they are indexed, the index is published, and copies of the GM are available to the public on request. *Permutit Co. v. Wadham*, 13 F.2d 454, 458 (6th Cir. 1926); *Bendix Corp. v. Balax, Inc.*, 421 F.2d 809, 811-12 (7th Cir. 1970).

The German microfilms fail as prior printed publications. They are not prior art under 35 USC §102.

Firestone relies on two German documents which are not microfilms. These documents, apparently captured from the Germans during or after the war, are completely without authentication. They were apparently found in a warehouselike library in England where they had been dumped, unbound, into folders stored in boxes. They were unearthed after this suit began by searchers working on the English case. They are not printed. There is no evidence they were ever published or that they were made available to the public (or even were in the English library) prior to November 20, 1950. They are not prior printed publications, nor prior art under 35 USC §102.

The third classification of disputed references is the preliminary and final mimeographed reports of the Wilmington Chemical Company. At least one of these reports was distributed to several individuals in the rubber industry. However, each was marked "Confidential." There is no evidence that dissemination to the general public was intended, nor that the public had access to the reports. See, *Ex parte Deaton and Kirkland,* 146 USPQ 549, 550-51 (P. O. Bd. App. 1965); *Stamicarbon N.V. v. Escambia Chemical Corp.,* 300 F.Supp. 1209, 1215 (N.D. Fla. 1969), *mod. on other grounds* 430 F.2d 920 (5th Cir. 1970).

These reports fail as prior printed publications. They are not prior art under 35 USC §102.

The large number of references cited against the patent is in itself evidence of lack of anticipation and lack of obviousness. *Hoeltke v. C. M. Kemp Mfg. Co.,* 80 F.2d 912, 917 (4th Cir. 1936); *Ric-Wil Co. v. E. B. Kaiser Co.,* 179 F.2d 401, 404 (7th Cir. 1950), *cert. den.* 339 US 958 (1950); *Minneapolis-Honeywell Regulator Co. v. Midwest-*

ern Instruments Inc., 298 F.2d 36, 38 (7th Cir. 1961); *Ling-Temco-Vought, Inc. v. Kollsman Instrument Corp.*, 372 F.2d 263, 268 (2d Cir. 1967). Typical of the language in these cases is the following from *Hoeltke*, at 917:

> "Defendant has cited 33 patents as basis for its contention that complainant's invention is lacking in novelty; and this in itself is some evidence of the weakness of the contention. Such a citation of so many prior patents almost inevitably means either that none of them is nearly like the invention of the patentee and that the attempt is being made to invalidate the patent because the patentee has brought together for the purposes of his invention devices to be found in prior patents of different character, or that prior attempts to solve the problem with which he was confronted have not met with success."

35 USC §102 sets out conditions for patentability. It states that a person shall be entitled to a patent unless, inter alia, the invention was previously patented or described in a printed publication. A patent held invalid under this provision is referred to as being anticipated by a prior art reference.

The standards of anticipation are strict. The invention must be disclosed within the four corners of a single reference. If a reference is silent or ambiguous with respect to an element or feature of the invention, that gap cannot be filled by an assumption or by combining one reference with another. An anticipating reference must teach the invention; it is not sufficient to point to its silence or ambiguity after the invention and argue that the invention could be made out from the reference. This thought was well expressed by Judge Learned Hand in *Asbestos Shingle, S & S Co. v. H. W. Johnsmanville Co.*, 184

F. 620, 626 (2nd Cir. 1910) where, in referring to an alleged prior art reference, he said:

> "The defendant's theory is that Sachs must have meant, by cements, hydraulic cements; that by the manufacture of cardboards he must have meant the use of the usual machines; and that by the suggestion which he made of the uses of his substance he therefore disclosed completely all that Hatschek did. That is not enough; the art must be enriched by more than fruitful intimations, untested suggestions, or pregnant surmise before the subsequent comer who has elaborated and proved the invention may be deprived of his right."

See also, *American Graphophone Co. v. Leeds & Catlin Co.*, 170 F. 327, 331 (2d Cir. 1909).

Prior publications and uses must do more than point to the goal. They must mark the path. See *Grubman Engr. & Mfg. Co. v. Goldberger*, 47 F.2d 151, 153 (2d Cir. 1931). It is clear that anticipation cannot be found unless all of the elements of the invention are disclosed in a single prior art reference. *Firestone v. Aluminum Co. of America*, 285 F.2d 928, 929-30 (6th Cir. 1960); *H. K. Porter Co., Inc. v. Goodyear Tire & Rubber Co.*, 163 USPQ 106, 114-5 (N.D. Ohio 1969), *aff'd*, 168 USPQ 449 (6th Cir. 1971); *Preformed Line Products Co. v. Fanner Mfg. Co.*, 328 F.2d 265, 271 (6th Cir. 1964). A patented combination cannot be anticipated piecemeal by finding individual features separately in the prior art. *Imhaeuser* v. *Buerk*, 101 US 647, 660 (1880); *Bates* v. *Coe*, 98 US 31, 48 (1878); *Panduit Corp. v. Stahlin Bros. Fibre Works, Inc.*, 298 F.Supp. 435, 442 (W.D. Mich. 1969), *aff'd* 430 F.2d 221 (6th Cir. 1970). The fact that a prior art reference might, by modification, be considered to disclose the invention is insufficient to establish anticipation if it were neither designed, adapted,

nor actually used in the performance of the invention. *Topliff v. Topliff,* 145 US 156, 161 (1892); *Trabon Engr. Corp. v. Dirkes,* 136 F.2d 24, 26 (6th Cir. 1943); *Spring-A-Way Displays of California, Inc. v. Ad-Rack, Inc.,* 249 F.Supp. 368, 370 (S.D. Ohio 1965).

An anticipating reference must bear within its four corners adequate directions for the practice of the invention. If it offers no more than a starting point for further experiments; if its teaching will sometimes succeed and sometimes fail; if it does not inform the art, without more, how to practice the new invention—it has not correspondingly enriched the store of common knowledge and it is not an anticipation. *Dewey & Almy Chemical Co. v. Mimex Co.,* 124 F.2d 986, 989-990 (2d Cir. 1942); *Lincoln Stores v. Nashua Mfg. Co.,* 157 F.2d 154, 160 (1st Cir. 1946); *Munishing Paper Co. v. American Sulphite Pulp Co.,* 228 F. 700, 703-4 (6th Cir. 1915); *Gordon Form Lathe Co. v. Walcott Mach. Co.,* 32 F.2d 55, 58 (6th Cir. 1929); *Morgan Const. Co. v. Wellman-Seaver-Morgan Co.,* 18 F.2d 395, 399 (6th Cir. 1927). Prior art involving an inoperative disclosure or one which fails to achieve its intended result (e.g., the Rostler, German, Government, and McMillan references) does not constitute an anticipation. *United States v. Adams,* 383 US 39, 50 (1966); *Trabon Engineering Corp. v. Dirkes,* 136 F.2d 24, 26 (6th Cir. 1943).

Disclosures in foreign prior art (e.g., the Rostler British patent and the German microfilm references) are strictly construed and are restricted to what is clearly and definitely disclosed therein. *National Latex Products Co. v. Sun Rubber Co.,* 274 F.2d 224, 236 (6th Cir. 1959), *cert. den.,* 362 US 989 (1960); *Morgan Const. Co. v. Wellman-Seaver-Morgan Co.,* 18 F.2d 395, 399 (6th Cir. 1927); *General Tire & Rubber Co. v. Watson,* 184 F.Supp. 344, 349 (D. D.C. 1960).

Faced with these strict legal principles, Firestone has not seriously asserted anticipation. Nevertheless, it has referred to certain groups of references as if they were anticipations.

Firestone concentrates on the similarities (real or imagined) between its references and its version of General's invention. In analyzing prior art references too, it is the differences that are relevant, and there are significant differences with respect to each significant reference corresponding to Firestone's own classification.

Firestone has alleged some eight prior use defenses. Only two need be discussed. One is the alleged prior knowledge or use by the Wilmington Chemical Company. The other is the alleged prior knowledge, use or sale associated with Tire Test 123.

35 USC §102 bars a patent if it was "known or used by others in this country" before the invention or if it was "in public use or on sale in this country" more than one year prior to the date of the application for the patent in suit. As in the case of a prior printed publication, a prior use, knowledge, or sale does not anticipate unless it be of the same perfected invention as that of the patent. Each element or feature of the invention must be found in the alleged prior knowledge, use, or sale to invalidate the patent. *Goodwin v. Borg-Warner Corp.*, 157 F.2d 267, 272 (6th Cir. 1946); *Winslow Mfg. Co. v. Peerless Gauge Co.*, 202 F.Supp. 931, 936 (N.D. Ohio 1958).

The proof of the asserted prior public use, sale, knowledge, or invention must be established by evidence that is so clear, convincing, and cogent as to admit of no reasonable doubt. *Radio Corp. of America v. Radio Engineering Laboratories, Inc.*, 293 US 1, 7-8 (1934); *The Barbed Wire Patent*, 143 US 275, 284 (1892); *Eibel Proc-*

ess Co. v. Minnesota & Ontario Paper Co., 261 US 45, 60 (1923); *Preformed Line Products Co. v. Fanner Mfg. Co.*, 225 F.Supp. 762, 768 (N.D. Ohio 1960), *aff'd*, 328 F.2d 265 (6th Cir. 1964); *National Latex Products Co. v. Sun Rubber Co.*, 274 F.2d 224, 231 (6th Cir. 1959); *Austin Machinery Co. v. Buckeye Traction Ditcher Co.*, 13 F.2d 697, 700 (6th Cir. 1926); *H. K. Porter Co. Inc. v. Goodyear Tire & Rubber Co.*, 163 USPQ 106, 115 (N.D. Ohio 1969), *aff'd* 168 USPQ 449 (6th Cir. 1971); *General Tire & Rubber Co. v. Watson*, 184 F.Supp. 344, 350 (D. D.C. 1960).

The alleged prior use must be public, perfected, not experimental, and not abandoned. *Goodwin v. Borg-Warner Corp.*, 157 F.2d 267, 273-4 (6th Cir. 1946); *cert. den.* 329 US 799 (1946); *FMC Corp. v. F. E. Meyers & Bro. Co.*, 384 F.2d 4, 9 (6th Cir. 1967), *cert. den.*, 390 US 988 (1968); *Elizabeth v. American Nicholson Pavement Co.*, 97 US 126, 135-6 (1878); *The Barbed Wire Patent*, 143 US 275, 285, 292 (1892); *Warren Bros. Co. v. City of Owosso*, 166 F. 309, 315-6 (6th Cir. 1909), *cert. den.*, 214 US 523 (1909).

The alleged sale or offer to sell must be a bona fide commercial transaction for profit and be a sale of the perfected device. A sale for experimental purposes, even if profitable, is not an anticipation. *Goodwin v. Borg-Warner Corp.*, 157 F.2d 267, 273-4 (6th Cir. 1946), *cert. den.* 329 US 799 (1946); *FMC Corp. v. F. E. Meyers & Bro. Co.*, 384 F.2d 4, 9 (6th Cir. 1967), *cert. den.*, 390 US 988 (1968); *Elizabeth v. American Nicholson Pavement Co.*, 97 US 126, 135-6 (1878); *The Barbed Wire Patent*, 143 US 275, 285, 292 (1892); *Warren Bros. Co. v. City of Owosso*, 166 F. 309, 315-6 (6th Cir. 1909), *cert. den.*, 214 US 523 (1909).

The defense of alleged prior use by Wilmington Chemical Company was presented to Judge Holtzoff and re-

jected. It was interposed again before Judge Watkins in Baltimore, then specifically dropped and finally resurrected before this Court.

The Wilmington Chemical report which purports to set out the work alleged as a prior use has been shown to fail as a prior printed publication and as an anticipation. The evidence of the work itself fares no better. No high Mooney rubber was shown; the amount of oil in the masterbatch is uncertain; no tire tread, or any other compound, was shown to have been made from the masterbatch. Firestone admits that the only attempt at compounding the material failed utterly. This work was unproved, not public, and at most an abandoned, unsuccessful experiment, never repeated.

The alleged prior use of the Test 123 was also before Judge Holtzoff (by way of the testimony of Dr. Reynolds of Phillips). The government's final report of Tire Test 123 (urged here as an anticipating reference by Firestone) was put before Judge Holtzoff by General as evidence of unobviousness. As with the Rostler work, it is undisputed that Tire Test 123 was an experiment. Again, as with the Rostler work, there can be no dispute that the Tire Test 123 work on the allegedly high Mooney rubbers was an abandoned experiment. Either of these reasons, standing alone, is sufficient to overcome the defense.

Information relating to Tire Test 123 was not available to the public. It qualifies, therefore, neither as prior public knowledge nor prior public use. It is clear that there was no "sale" or offer of sale with respect to the tires of Tire Test 123 within the meaning of 35 USC §102(b). This work was not proved by evidence of what was actually done, nor did it constitute an anticipation of the invention of the patent in suit. It was at most an abandoned experiment which led away from the invention

by recommending the use of 50 Mooney cold rubber with two parts of softener as the direction in which the industry should proceed.

Firestone's main defense of invalidity is based on 35 USC §103, which provides:

> "A patent may not be obtained though the invention is not identically disclosed or described as set forth in Section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."

Exercising the human inclination to hindsight, Firestone assembled its 144 references and selected from them bits of information which it pieced together to form a mosaic *now* said to point like an arrow directly to the invention. This approach is not permitted by 35 USC §103 or the case law.

In applying the test of obviousness, the Court must determine the pertinent art and the level of ordinary skill possessed by the person in that art. The scope and content of the prior art and the differences between that art and the claimed invention must also be determined. *Graham v. John Deere Co.*, 383 US 1, 17-18 (1966); *H. K. Porter Co., Inc. v. Goodyear Tire & Rubber Co.*, 168 USPQ 449, 450-51 (6th Cir. 1971).

The claims and specification are to be read together, with a view to ascertaining the invention against which the prior art is to be applied, *United States v. Adams*, 383 US 39, 49 (1966). This application must be carried out not by hindsight, but with foresight applied as of the date of the invention. *Goodyear Tire & Rubber Co. v. Ray-O-*

Vac Co., 321 US 275, 279 (1944); *Diamond Rubber Co. v. Consol. Rubber Tire Co.*, 220 US 428, 434-5 (1911); *Expanded Metal Co. v. Bradford*, 214 US 366, 381 (1909); *Webster Loom Co. v. Higgins*, 105 US 580, 591 (1892); *Simplicity Mfg. Co. v. Quick Mfg. Co.*, 355 F.2d 1012, 1015 (6th Cir. 1966).

In assessing the prior art, the Court must have regard for all of the signposts contained in it. It must consider the passages and references which point away from the invention as well as those said to point toward it. Known disadvantages in old devices which would naturally discourage search for new inventions may be taken into account in determining unobviousness. *United States v. Adams*, 383 US 39, 52 (1966). What would have been obvious to one skilled in the art at the time the invention was made is determined in view of the sum of all the relevant teachings in the art, not in view of first one and then another of the isolated teachings of the art. *Application of Kuderna*, 426 F.2d 385, 389 (C.C.P.A. 1970). Mr. Justice Graham, in England, expressed this principle succinctly, as applied to the U.K. counterpart of the patent in suit, at GX2520, pp. 63-64:

> "The whole of the relevant prior art must be assumed to be in the mind of the skilled addressee and this may well produce, and would produce here, as the history of the matter shows, quite a different result from that which would be produced if a careful selection from prior art is made, having the invention which is sought to be attacked in mind."

The above cases set the legal framework within which the Court is to determine obviousness or unobviousness. These bare bone principles are not always easy to apply, however, since they tend to treat as objective a test which is fundamentally subjective. Consequently, courts have

developed certain empirical signposts of invention, not in derogation of the statutory test of invention, but in implementation of it. Judge Learned Hand was one of the first to clearly express this concept. In *Safet Care Heating & Lighting Co. v. General Electric Co.*, 155 F.2d 937, 939 (2d Cir. 1946), he said that, insofar as the information was available courts had best appraise invention:

> ". . . by the circumstances which preceded, attended and succeeded the appearance of the invention. Among these will figure the length of time the art, though needing the invention, went without it: the number of those who sought to meet the need, and the period over which their efforts were spread: how many, if any, came upon it at about the same time, whether before or after: and—perhaps most important of all—the extent to which it superseded what had gone before. We have repeatedly declared that in our judgment this approach is more reliable than *a priori* conclusions drawn from vaporous, and almost inevitably self-dependent, general propositions."

More recently, the Supreme Court has spoken on this subject, holding in *Graham, supra*, at pp. 17-18:

> "Such secondary considerations as commercial success, long felt but unresolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject sought to be patented. As indicia of obviousness or unobviousness, these inquiries may have relevancy."

In *United States v. Adams*, 383 US 39, 51-52 (1966), the Supreme Court expanded upon the secondary considerations enumerated in *Graham*. Among the considerations relied upon in the Court's finding of unobviousness

were: the obtaining of unexpected results arising from a novel, interacting combination of old elements; the initial expressions of disbelief by those skilled in the art, followed by widespread adoption of the invention; and the fact that the combination of elements was made in the face of respected and long-accepted teachings in the art which would naturally discourage the combination.

The patentees' overcoming of a "technological block" (that large quantities of oil could not be used in quality products such as tire treads) which those skilled in the art had not previously eliminated also constitutes cogent evidence of invention. *Expanded Metal Co. v. Bradford,* 214 US 366, 381 (1909); *Goodyear Tire & Rubber Co. v. Ray-O-Vac Co.,* 321 US 275, 279 (1944); *National Latex Products Co. v. Sun Rubber Co.,* 274 F.2d 224, 240 (6th Cir. 1959), *cert. den.,* 362 US 898 (1960); *Cold Metal Process Co. v. Republic Steel Corp.,* 233 F.2d 828, 838 (6th Cir. 1956); *H. K. Porter Co., Inc. v. Goodyear Tire & Rubber Co.,* 163 USPQ 106, 114-15 (N.D. Ohio 1969), *aff'd,* 168 USPQ 449 (6th Cir. 1971); *Schnell v. Allbright-Nell Co.,* 348 F.2d 444, 447 (7th Cir. 1965), *cert. den.,* 383 US 934 (1966).

Courts have also held that while lack of commercial recognition of a reference may not be relevant to the issue of anticipation (compare *Tillotson Mfg. Co. v. Textron, Inc., Homelite,* 337 F.2d 833, 837 (6th Cir. 1964) and *Kaiser Industries Corp. v. McLouth Steel Corp.,* 400 F.2d 36, 45 (6th Cir. 1968), with *Panduit Corp. v. Stahlin Bros. Fibre Works, Inc.,* 298 F.Supp. 435, 446 (W.D. Mich. 1969), *aff'd,* 430 F.2d 221 (6th Cir. 1970), the failure of such reference to get recognition in the trade is relevant to a showing of unobviousness. *Campbell v. Mueller,* 159 F.2d 803, 808-9 (6th Cir. 1947); *Panduit Corp. v. Stahlin Bros. Fibre Works, Inc.,* 298 F.Supp. 435, 446, *aff'd,* 430 F.2d 221 (6th Cir. 1970). These cases are pertinent in evaluating work

such as that of McMillan, Rostler, the German art, Tire Test 123, and the rest of Firestone's references, since none was commercially significant.

All of the indicators of unobviousness approved by the courts are present: the reaction of disbelief and skepticism by those skilled in the art, followed by surprise, praise, and total adoption; the revolutionary commercial success; the enormous savings gained by using the invention; the fact that every significant tire manufacturer, except Firestone, has taken a license; the long-felt need, unsolved by others working on the problem with great incentive, both from the standpoint of economics and national security; and the solution by the inventors, reached in part by accident and flying in the face of long-accepted teachings against the combination of the invention.

After the fact, Firestone has assembled dozens of references from which they argue obviousness, yet they cannot explain why the industry did not think to use this "obvious" invention to effect great savings and alleviate the shortage of rubber-producing capacity in 1950. After the fact, Firestone presented witnesses who say it had all been known before, yet they cannot explain where the pioneers were when the invention was made. Dr. Semon was presented as one of the outstanding men in the rubber industry, with over 100 patents and many high awards. His skill was above that of the man of "ordinary" skill in the art, yet the invention was unobvious to him. After the fact, counsel for Firestone disparaged the invention, yet Firestone had praised it, and even now says that it could not operate its tire factories without using it (GX 2687, pp. 5-9). General's invention is proved unobvious by the genuine, contemporaneous reactions of those skilled in the art.

Firestone asserts a royalty-free license (said to have been given it by the government, which is said to have obtained it under the provisions of General's Research Contract) as a defense to General's charge of infringement in the manufacture of tire treads and tread stocks. The first relevant inquiry, therefore, should be whether the express terms of that Research Contract (said to be unambiguous by Firestone) provide for any license to tire treads or tread stocks. The answer is clearly, no; the clear, unambiguous language of the contract excludes the license Firestone seeks. Paragraph 3 limits the scope of authorized research (and accompanying license) to the production of rubber and carbon black masterbatches. It was never further extended in any material respect. Paragraph 6, the only paragraph which could provide for the submission of information (and an accompanying license) beyond the scope of Paragraph 3, specifically excludes "*subsequent compounding,*" that is, the process of making a tire tread or other end-products from rubber.

If there were any doubt, the history of the Research Contract makes it clear that the plain meaning of its terms was the intended meaning.[3] It shows that prior to the passage of the Rubber Act of 1948, the government expressly authorized research and acquired license rights in the fields of rubber compounding and end-products. This was accomplished by agreements such as the Cross-License, Compounding, and Patent Agreements Relating to Research Work (none of which was entered into by General). The Rubber Act did not authorize such research, however; it limited government research to the improvement of snythetic rubber per se. This Act necessitated the renegotiation of the research arrangements previously in

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3) Both Firestone and General say that the contract is unambiguous, but disagree as to its meaning. Its history may, therefore, be relevant to show the variance between that history and the meaning Firestone now says should be given to its language.

effect, with the result that all reference to research or license rights with respect to compounding, tires, treads, tread compounds, or other end-products was eliminated. See 11 O. Jur. 2d 410, Contracts §163.

Another relevant factor in the construction of the Research Contract (if construction is deemed necessary) is General's Operating Agreement, of which it is a part. The Operating Agreement clearly related only to the production of synthetic rubber, made to government specifications in the government-owned plant at Baytown, Texas. It had nothing to do with compounding, tire treads, or end-products. Section 3(i), which provided for research expenditures, to the extent approved in advance by Rubber Reserve, was specifically limited to "processes used or intended to be used" in the "manufacture of Synthetic Rubber." Correspondingly, any license rights granted to the government by Section 8 of the Operating Agreement were limited to the "manufacture of Synthetic Rubber." While General did not engage in any research provided for under the Operating Agreement, its Research Contract, when entered into, was specifically stated to be in implementation of and pursuant to Section 8 of the Operating Agreement. It is, therefore, clear that the research authorized and rights acquired by the Research Contract could be no broader than those under the Operating Agreement of which the Research Contract was a part:

> ". . . A contract should be construed in the light of a previous contract which is evidently designed to control the relations of the parties for a period covered by the latter contract, unless the latter contract is manifestly an abrogation of the former.
>
> "When a written agreement consists of more than one distinct writing or contract, the different provisions of all should be given due weight in ascertain-

ing the intended meaning of any portion of the same. . . 11 O. Jur. 2d 395, Contracts §149."

The patent does not claim any invention made as a result of or as part of the work done by General under the Research Contract. The invention was made privately, at General's own expense. It was completed before any work at Baytown on oil-extended rubber is even alleged to have taken place. In fact, no invention (patented or otherwise) is charged to have been made by General as a part of the government-reimbursed research, nor is it charged that General failed to provide the government with all information relating to its reimbursed work. Firestone has not even charged that it uses any information generated by General under the Research Contract in the manufacture of its infringing products.

It is apparent that Firestone does not have an expressed license covering the invention of the patent in suit. Its main theory on this issue is one of implied license, based on the premise that the main, but by no means only, use of synthetic rubber is in tires. Therefore, Firestone argues, it must follow that the government, which was interested in establishing a viable synthetic rubber industry, would demand a license to the rubber's chief end-product as well as to the rubber itself, and that the Research Contract should be read as if it had done so.[4] *Andrews v. Deering Milliken, Inc.*, 382 F.2d 799, 803 (6th Cir. 1967).

This argument is unsound because it asks the wrong question. The question is not why the government did what it did, but what did it do. The fact is that the plain language of the contract, never modified, does not au-

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4) Firestone admitted in oral argument that the government was not interested in and had no intention of entering the tire-making business.

thorize research or grant licenses in the fields of compounded goods or end-products for rubber. If a "why" is of interest, the Rubber Act provides the answer, as discussed above.

There are many factors negating any implied license to tire treads or tread stocks. Perhaps the most striking is the parties' mutual understanding of the key terms of the contract, expressed during the negotiations.

On December 7, 1949, Mr. Knowlton, General's chief negotiator and General Counsel, wrote to Mr. Hadlock, the Government's negotiator and Executive Director of Rubber Reserve, regarding the meaning of paragraph 7 (the license paragraph) of the proposed Research Agreement furnished with Hadlock's letter of November 23, 1949. Messrs. Knowlton and Hadlock discussed this paragraph by phone on December 9 and each made notes, Hadlock's on the original and Knowlton's on the retained copy of the December 7 letter. In addition, Mr. Knowlton made a separate memorandum on December 9, wrote a letter to Mr. McCoy, General's outside counsel, on December 13, and wrote a confirming letter to Hadlock on December 16. The clear intent of both parties is summarized in the December 16 letter which states that the words "without limitation" in paragraph 7(1) of the agreement refer:

> ". . . to the kind of use that RFC may make of the invention and the resulting information relative to production [of synthetic rubber], and do not refer to the subsequent use of the product in other patentable combinations."

Thus, the understanding of both parties at the time the agreement was executed conformed with the plain meaning of the agreement—that no license rights with respect to end-products were to be conveyed.

It is elemental that a license cannot be implied when there is an expressed license which is explicit. *Hazen Mfg. Co. v. Wareham,* 242 F. 642, 647 (6th Cir. 1917); *Henry J. Kaiser Co. v. McLouth Steel Corp.,* 175 F.Supp. 743, 749 (E.D. Mich. 1959), *aff'd,* 277 F.2d 458 (6th Cir. 1960). A license cannot be implied contrary to the intent of the parties to an express agreement covering the subject matter. Negotiations leading up to the express agreement are clearly (and necessarily) to be considered in determining this intent of the parties and, where the terms are in dispute, in construing the contract. *Corbett v. Winston Elkhorn Coal Co.,* 296 F. 577, 579 (6th Cir. 1924); *Owensboro Ditcher & Grader Co. v. Markham,* 32 F.2d 564, 566 (6th Cir. 1929).

While the sale of a product which has only one use may carry with it an implied license to use it in the intended way, such license does not attach where, as here, it is stipulated that the product has other important uses. Further, the right to "use" a product such as a rubber masterbatch refers to the right to use the masterbatch itself, so long as it retains its separate identity. It does not extend to uses in other patentable combinations. *Rubber Tire Wheel Co. v. Goodyear Tire & Rubber Co.,* 232 US 413 (1914); *Nachman Spring-Filled Corp. v. Kay Mfg. Corp.,* 78 F.2d 653, 657 (2d Cir. 1935); see also, *Aralac, Inc. v. Hat Corporation of America,* 166 F.2d 286, 293 (3rd Cir. 1948). *Rubber Tire Wheel* held that Goodyear's rights in its rubber, one use of which was in a patented tire combination, did not extend to the use of the rubber in that combination. The Supreme Court held that Goodyear's rights in the rubber attached to it as an article of commerce:

> ". . . and it continues only so long as the commodity to which the right applies retains its separate identity. If that commodity is combined with other

things in the process of the manufacture of a new commodity, the trade right in the original part as an article of commerce is necessarily gone." 232 US at 418-19.

Since the government had no license, the question whether Firestone obtained it from the government need hardly be argued. It is apparent from these proposed findings that the government had no authority, intent, or justification for giving away valuable patent rights relating to tires in connection with the sale of its synthetic rubber plants. By Firestone's own estimates, this would have been a multimillion dollar bonanza, completely without consideration to the government (DX 1836). Certainly, it cannot be assumed that the Disposal Commission had authority to give away valuable government rights.

In order to constitute a waiver, there must be an intentional relinquishment of a known right. The facts show no such intent or action on General's part. Further, there is no evidence that either the government or Firestone were misled or relied upon any of General's actions. *American Locomotive Co. v. Chemical Research Corp.*, 171 F.2d 115, 121 (6th Cir. 1949); *Everhart v. State Life Ins. Co.*, 154 F.2d 347, 356 (6th Cir. 1946); *Joyce v. Gentsch*, 141 F.2d 891, 897 (6th Cir. 1944); *In re Euclid Doan Co.*, 104 F.2d 712, 715 (6th Cir. 1939).

Firestone's estoppel theory is self-defeating. If the government were not entitled to a license, then everything General is accused of was perfectly proper and consistent with there being no license. If the government were entitled to a license, then any action by General in attempting to avoid the license would have been ineffective and, hence, irrelevant.

Firestone has raised certain miscellaneous defenses, including a charge that the patent is invalid for failure to comply with the requirements of 35 USC §112; that the patent is invalid because of an alleged fraud on the Patent Office; and that the patent is unenforceable because of an alleged misuse. These allegations, dubious from the outset, were shown to be without substance or relevance at the trial.

It is clear that the patent in suit is valid, infringed, enforceable, and not licensed. According to pretrial agreement, the amount and measure of damages arising from Firestone's infringing acts need not be argued or decided now. This issue will be left to a subsequent proceeding, after appellate procedures have been exhausted.

Similarly, the amount of any award arising from the Court's ruling on the question of "costs, attorneys' fees, and punitive damages," deferred in this Court's Memorandum and Order of June 22, 1970, attached hereto as Appendix A, can properly be left to a proceeding subsequent to appellate review of the finding of fraud pursuant to Rule 54(b), F.R.C.P. and so it shall be.

Therefore, it is hereby ordered that U. S. Patent 2,964,083 is valid, enforceable, infringed, and not licensed. This holding (but not the accounting) is specifically directed to the infringement of representative Claims 1, 3-5, 7, 13, 14, 17-19, and 22 by representative Stock A, Blend 2, and Blend 5 (and tires whose treads are made therefrom) in view of the pretrial order limiting trial to those representative stocks and claims.

/s/ Frank J. Battisti
Chief Judge

FINDINGS OF FACT AND CONCLUSIONS OF LAW
(Nos. 36,799 and C67-206)

(Filed June 26, 1972)

FINDINGS OF FACT

The Parties, Actions, and Jurisdiction.

1. This is a patent infringement action involving The General Tire & Rubber Company (hereafter "General"), an Ohio corporation whose principal place of business is in Akron, Ohio, and The Firestone Tire & Rubber Company (hereafter "Firestone"), also an Ohio corporation whose principal place of business is in Akron, Ohio.

2. The patent in suit, U. S. Patent No. 2,964,083 entitled "Pneumatic Tires and Tread Stock Composition," was issued to General on December 13, 1960, and is and has been owned by General since that date.

GX2516[1] par. 1

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1) Throughout, the following code will apply: "DX"—General Baltimore exhibit; "PX"—Firestone Baltimore exhibit; "GX"—General Cleveland exhibit; "FX"—Firestone Cleveland exhibit; "B1000"—Baltimore transcript page; "C1000"—Cleveland transcript page.

3. The history of litigation with respect to this patent has been complex and protracted. Infringement actions on the patent have been brought in this Court by General against Firestone, Goodyear, Uniroyal, Goodrich, Mohawk, Dunlop, Mansfield, Denman, McCreary, and Seilon. With the exception of Firestone, these actions have been settled. In addition, General has entered into license agreements under the patent with Armstrong, Carlisle, Cooper, Gates, Hercules, and Schenuit. Foreign counterparts of the patent in suit have been or are being litigated in at least England, France, South Africa, and Mexico.

FX2897 FX2946 GX2519
GX2675 FX2947 FX2948
GX2520 GX2518

4. For practical purposes, the controversy has narrowed to one between General and Firestone. Its entry into the legal arena began on March 30, 1961, when Firestone and co-plaintiff, McCreary Tire & Rubber Company, filed a declaratory judgment complaint against General in Baltimore, Maryland. That action (hereafter the "Baltimore case") sought a declaration that the patent in suit was invalid, not infringed, and licensed to Firestone royalty-free. General responded on April 4, 1961, by filing an infringement action against Firestone in this Court (hereafter the "Cleveland case"), thus joining Firestone to the ranks of Goodyear and Uniroyal (then U. S. Rubber) whom General had sued for infringement in this Court on December 13, 1960, the day the patent issued. Also, on October 23, 1961, General filed a counterclaim for infringement in the Baltimore case.

Complaint (C67-206)
Complaint (36,799)
Counterclaim (C67-206)

5. General's prosecution of the Cleveland infringement action against Firestone was enjoined by the Baltimore Court, and trial of the Baltimore case commenced April 15, 1964. That trial continued until January 11, 1967, during which time a record of some 38,000 pages of transcript and over 2,000 identified exhibits was amassed.

130 U.S.P.Q. 138, 139

B1

B38,267

6. On January 11, 1967, the United States Court of Appeals for the Fourth Circuit, acting upon a petition for writ of mandamus filed by General, entered an opinion, and the next day a formal order, directing the Baltimore Court to transfer the Baltimore case to this Court. The reasons for this transfer and a detailed history of the Baltimore case appear in the opinion of the Court of Appeals reported at 373 F.2d 361.

Writ, January 12, 1967

7. The transfer became final once the Supreme Court denied Firestone's petition for certiorari; this Court then dissolved the injunction prohibiting General from proceeding in the Cleveland case and the parties began preparation for trial. During the course of that preparation they were required to submit detailed outlines of their cases, including lists of issues, witnesses, documents to be relied upon, and evidence expected to be elicited. In addition, some 16 pre-trial conferences were held. Following the guidelines set out in the Handbook of Recommended Procedures for the Trial of Protracted Cases adopted by the Judicial Conference of the United States and, later, the Manual for Complex and Multi-district Litigation, the Court and the parties expended substantial efforts to

clarify and narrow issues and to set ground rules prior to trial to the end that the trial would not be unduly protracted.

386 U.S. 960 (1967)
Pretrial Conf. June 14, 1968, pp. 28-32

8. On June 22, 1970, this Court, acting upon General's motion, entered a memorandum opinion and order dismissing Firestone's declaratory complaint in the Baltimore case for fraud and unclean hands and as being unnecessary for the full protection of Firestone's rights in defending against General's infringement action. That memorandum and order also consolidated all other litigable issues in the Baltimore case with General's infringement complaint in the Cleveland case and deferred consideration of the question of costs, attorneys' fees, and punitive damages arising from the Court's determination of fraud.[2]

Memorandum Opinion and Order, June 22, 1970, pp. 12-15

9. In its memorandum and order of June 22, 1970, the Court also denied Firestone's motion to dismiss both the Cleveland and Baltimore cases for an alleged patent misuse by General.[3] The memorandum and order of June 22, 1970, constitutes this Court's Findings of Fact and Conclusions of Law with respect to the issues therein decided.

Memorandum Opinion and Order pp. 24-25

10. Trial of the Cleveland case and all litigable issues from the Baltimore case commenced September 30,

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2) Firestone's appeal from this order was dismissed, 431 F.2d 1199 (6th Cir. 1970), *cert. den.* ..... U.S. ..... (1971).

3) Firestone's petition for writ of mandamus with respect to this order was denied. 431 F.2d 1199 (6th Cir. 1970).

1970, and concluded January 22, 1971, after some 45 days of trial. The Cleveland record comprises nearly 6,000 pages of transcript and over 600 identified exhibits. The entirety of the Baltimore record, except insofar as portions of it were struck or limited on motion of one or the other of the parties, also has been made a part of the record of this action.

C1
C5904

11. The findings and conclusions made herein are applicable to both the Cleveland case and all remaining litigable issues in the Baltimore case, including the previously reserved questions of costs, attorneys' fees, and punitive damages arising from the prior finding of fraud.

12. This Court has jurisdiction of the parties and subject matter. Venue in this District is proper.

The Issues.

13. The claims of the patent in suit fall into two main groups: those directed to pneumatic tires (claims 1-12) and those directed to a vulcanizable rubber tire tread stock (claims 13-22).

GX2516, par. 2

14. Paragraph 34 of Agreed Statement of Facts No. 1 charts some 20 Firestone tire tread stocks which are charged with infringement of tread stock claims 13-22 and, when applied as the vulcanized tread portion of a pneumatic tire, with infringement of all but claims 9 and 10 of the pneumatic tire claims.

GX 2516, par. 2 & 3

15. For purposes of limiting the length of trial, the number of claims in issue was reduced to 11 representative

claims (1, 3-5, 7, 13, 14, 17-19, and 22) and the number of tread stocks to three representative stocks (Stock A, Blend 2, and Blend 5).

Memorandum Opinion and Order,
Sept. 23, 1970

16. Firestone denies infringement, asserts invalidity of the patent, and claims a royalty-free license under the patent arising out of a research agreement entered into between General and the United States. Ancillary to its claim of license, Firestone also contends that the patent is unenforceable for unclean hands due to an alleged violation by General of its fiduciary duties to the United States and that General has waived its right to enforce the patent due to other alleged breaches of its obligations to the United States. Finally, Firestone has raised the defense of patent misuse against the enforceability of the patent. These defenses will be considered individually below.

Firestone Pretrial Brief

The Patent.

17. The application for the patent in suit was filed November 20, 1950, in the names of Emert S. Pfau, Gilbert H. Swart, and Kermit V. Weinstock. At that date Mr. Swart was General's director of research; Mr. Pfau was a polymerization chemist and Mr. Weinstock was a research compounder, both working under Mr. Swart.

Pfau, B709-12	Weinstock,[4] DX1367, pp.
Swart, B7255-58, 7281	33-34
DX1001	GX2680, pp. 7-8

4) Weinstock died prior to trial. His depositions, previously taken in the Baltimore case and in the Goodyear case, were marked and received as physical exhibits.

18. The course of the application in the Patent Office was unusual and protracted. It was assigned originally to Division 45, a Patent Office examining unit which deals with tires. The application was allowed by the appropriate examiner in Division 45 on December 10, 1954. The applicants promptly paid the required final fee, leaving only the mechanical task of printing to be accomplished before the patent would issue. On December 28, 1954, however, another examiner (assigned to Division 50, a unit which deals with synthetic rubber) requested that the application be withdrawn from issue and transferred to his unit. This request was granted by the appropriate authorities. The Division 50 examiner eventually rejected the application, and his rejection was upheld by the Patent Office Board of Appeals.

PX1001 184 F.Supp. 344, 346
DX1002

19. Following the rejection by the Patent Office, suit was brought against the Commission of Patents in the federal district court for the District of Columbia pursuant to 35 U.S.C. 145 to secure an adjudication that General was entitled to a patent. Trial of that action was had in June, 1960, before Judge Holtzoff. The Commissioner of Patents was represented by counsel for the Patent Office and, in what appears to have been an unprecedented action, also by counsel from the Department of Justice. Judge Holtzoff heard testimony from 19 witnesses (including 6 deposition witnesses).

184 F.Supp. 344 DX1393
DX1002

20. After considering the evidence, Judge Holtzoff entered his opinion and findings that General was entitled to a patent. Prosecution then resumed in the Patent

Office where certain other claims were added and allowed, and the patent issued on December 13, 1960, ten years after the application had been filed.

184 F.Supp. 344 PX1001
DX1002

21. It is apparent from the above history of the prosecution of the patent in suit that the question of invention has undergone not only the careful scrutiny of the Patent Office, *ex parte*, but has also been subjected to the adversary processes of the federal court system, prior to its presentation to this Court. Because the patent was granted after such adversary proceedings, the Court finds that the presumption of validity attaching to the issuance of the patent is strengthened substantially.

PX1001 DX1002
DX1393

The Art.

22. The invention, to use the words of the patent, "relates to pneumatic tires having extruded tread portions of an exceedingly tough synthetic rubber." In order to understand the context and the subject matter of the invention it is necessary first to understand the relevant art at the time of the invention.

DX1001, Col. 1, lines 18-19

23. The basic ingredient in a pneumatic tire tread is rubber. Prior to World War II, natural rubber, procured in the form of a milk-like latex from rubber trees, was used for this purpose. During the war, however, both Germany and the United States were cut off from the major sources of natural rubber and both were forced to turn to the production of synthetic rubber as a substitute.

GX2516, par. 6, 13 & 14 DX1288, pp. 17-23

24. Germany had developed a number of types of synthetic rubbers prior to 1940, including one which had commercial promise for the making of tire treads. In anticipation of the possibility of war, the Germans had taken an early lead in the commercial production of this rubber, made from the chemicals butadiene and styrene, and known as "Buna S." While information concerning Buna S was available in the United States before the war and the product was familiar to some of our scientists on a laboratory basis, it had not been produced here commercially.

GX2516, par. 13 & 14 DX1288, pp. 17-23

25. In the early 1940's the United States began the commercial production of butadiene-styrene synthetic rubber under the control of, and in plants owned by, the Government. This rubber was also called Buna S, even though its characteristics were quite different from the German Buna S (as will be discussed later). In 1942, the Government issued a directive that the American butadiene-styrene rubber should be called GR-S (government rubber-styrene), but for some time thereafter the American rubber was referred to in this country by both designations. After the Government relinquished control of the rubber program, it became known by its present designation, SBR (styrene-butadiene rubber).

GX2516, par. 14 & 15 Gruber, C134-40, 150
PX1988 tab B DX1752, p. 1
PX1993

26. The GR-S rubber produced in the United States prior to 1955 was made in government-owned plants controlled by a government agency known as the Office of Rubber Reserve but operated by private companies. The

normal manufacturing procedure was as follows: liquid butadiene, a conjugated diolefine having four carbon atoms, was mixed with a water emulsion of styrene in the presence of the necessary chemicals to start and control the polymerization reaction.[5] One of the added chemicals was known as a modifier. Its function was to "modify" the reaction to produce a polymer of a given plasticity. The more modifier added, the shorter the molecular chains and more plastic or workable the rubber.[6] At the desired time, usually when the polymerization reaction was about 70% complete, another chemical, called a "shortstop," was added to terminate the reaction.

GX2516, par. 15 Gruber, C133-141
DX1288, pp. 17-39, 270-75

carbon known as a carbo black masterbatch.

27. This polymerization reaction produced a latex of extremely small rubber particles dispersed in water. The rubber particles were then precipitated out of the dispersion (coagulated) by the addition of an acid, and the resultant rubber, looking somewhat like cottage cheese, was then washed, dried, and compressed into bales weighing about 75 pounds. This bale of rubber was the end product of the American synthetic rubber plants. A few plants, such as the one operated by General at Baytown, Texas, added carbon black prior to the coagulation of the latex

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5) Polymerization refers to the joining of molecules in a chain which can be visualized as the fastening together of a chain of paper clips. The product of a polymerization reaction is called a polymer. The building blocks, butadiene and styrene, are called monomers.

6) The polymerization reaction can be varied to produce a product which varies from a honey-like liquid to a hard solid, including all ranges of plasticity between these extremes. As a general statement the tougher or less plastic the rubber, the longer the molecular chain and, accordingly, the better the abrasion resistance of the rubber.

and thus produced as an end product a bale of rubber and carbon black known as a carbon black masterbatch.

GX2516, par. 16 GX2522, p. 672

28. The bales of rubber from the polymer plants were then sold to various manufacturers of rubber products, most notably tire makers.[7] Tire makers in the United States insisted upon a synthetic rubber with a plasticity such that it could be processed in the same manner, on the same equipment, and in the same times as had been usual for processing natural rubber. This led the Government to specify that all standard GR-S be modified to a plasticity which would allow the rubber to be processed in the time and equipment usual for natural rubber (about 50 Mooney).[8]

GX2516, par. 14 GX2522, p. 373
DX1288, pp. 53-58, 69-89

29. Thus, in this country, plasticity became one of the most important controls in the production of synthetic rubber, and, in 1942-43, the Mooney plastometer (named after Dr. Melvin Mooney) came into use as the standard measurement for this plasticity. A Mooney machine measures the resistance to retation of a serrated metal disk embedded in a rubber sample heated to 212° F and registers this resistance to shearing forces on a dial in Mooney units. The higher the Mooney reading of a given rubber, the less plastic and more difficult it is to process.

GX2516, par. 3 & 4 Soday, C3486-87

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7) While most SBR rubber is used by the tire industry, there are other substantial uses such as in belting, hose, automotive parts, shoe soles and heels, sporting goods, coated fabrics, molded parts, household and mechanical goods, rubber mats, and flooring.

8) "Mooney" is described in Findings 29-30.

30. Two types of disks or rotors may be used in the Mooney machine—large and small. The shorthand notation for the Mooney reading indicates which rotor was used: "ML-4"—large rotor reading after 4 minutes of rotation (not counting a 1 minute initial warmup period); "MS-4" —small rotor after 4 minutes.[9] Large rotor Mooney readings above 120 may be unreliable since the specimen may slip or tear as the rotor turns, thereby giving a reading which is lower than it should be. The small rotor reduces the shearing force and overloading of the machine and is generally considered to provide more reliable readings on the tougher rubbers, although it too is subject to increasing unreliability as the toughness becomes extreme. It is generally accepted that small rotor units may be converted to large by multiplying the small rotor reading by 1.8.

GX2516, par. 3 & 4 — Baker, B520,5549-50
Niemeyer, B11,284-85

31. At an early date, the standard government plasticity specification for GR-S rubber was set at 50 Mooney. Prior to this, some GR-S had been made at 60 Mooney or possibly 65, but the tire makers complained that even at this figure they had difficulty processing the rubber because it was "too tough" and accordingly the Mooney was adjusted to 50 5.[10]

GX2516, par. 5 & 14 — Baker, B5157,6635-41
DX1152 tab 25-F — Alliger, C418-19
GX2522, pp. 375, 806

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9) Where no shorthand notation appears, it is understood that the large rotor is referred to.

10) Natural rubber has a Mooney of about 120, but unlike synthetic rubber, it quickly becomes more plastic when worked (reducing its Mooney to about 50) and causes no processing difficulty. It was necessary, however, to increase its plasticity by subjecting the natural rubber alone to a milling operation prior to the incorporation of carbon black.

32. Butadiene-styrene rubber having a Mooney of about 100 (known as GR-S 85) was available in this country from about 1943. Although GR-S 85 was used to some extent for asbestos packing, it was not used for tire treads, despite its known superior properties. The compounding committee of Rubber Reserve, made up of representatives of Goodyear, Firestone, Goodrich, and U. S. Rubber, declined even to test a GR-S in this Mooney range.

DX1272 tabs F & H Soday, C3497-3502

33. A major difference between the synthetic rubber produced in America and Germany was that the Germans added little or no modifier in their polymerization reaction. As a result their rubber, as shipped from the polymer plant, had little plasticity and could not be used by the tire makers until after it had been put through a special treating process. This process, known as heat treatment or heat degradation, involved heating the rubber in large ovens in the presence of air or oxygen, causing the long-chain molecules to break and the rubber to become more plastic.

PX1221, tabs A & B GX2522, pp. 373, 937-86
DX1288, pp. 17-23

34. In other words, a German polymer maker produced a form of rubber which its tire-producing customer could not process without first installing expensive and massive equipment to heat the rubber in the presence of air, thereby oxidizing and softening it. This heat degradation had to be carried out at the tire factory rather than at the polymer plant because the heat softened rubber returned to an unworkable plasticity if not used within a few days of the heat softening operation and could not be re-softened. This was in contrast to the rubber produced

by the American polymer plants, which, because its plasticity had been modified, was ready for use by the tire maker without any treatment to make it more plastic.

PX1221, tabs A & B
DX1288, pp. 17-23
GX2683, tabs 136A, 138
GX2522, pp. 373, 937-86

35. Even with heat degradation the German tire plants were not able to use their existing equipment, designed for processing natural rubber, without both slowing the equipment and extending the processing times.

PX1221, tabs A & B

36. The Germans did not use the Mooney machine, nor measure plasticity as such, but measured the hardness of their rubber with an instrument known as the "defo" machine. This machine measured the weight required to produce a given vertical compression of a standard sized rubber sample in a given time and its recovery in a given time after removal of the weight, unlike the Mooney machine which measured the shearing resistance of a sample to the rotation of a disk which is embedded in it.[11] There is no generally recognized correlation between defo-type values and Mooney values.

GX2522, p. 939
GX2516, par. 3 & 4
GX2682, tabs 470, 958
Schadendorff, B35,379-80

37. The German and American rubbers were both polymerized at a temperature of about 122° F. In 1947-48,

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11) Other devices which have been used to measure plasticity include the Scott, Williams, and Hoekstra machines. While all plasticity measuring instruments have their shortcomings, the Mooney machine is considered to provide the most useful measurement of plasticity. It is now used throughout the world as the standard plasticity measurement.

however, the Americans began to use what proved to be an improved GR-S which was polymerized at a temperature of about 41° F. This rubber was called "cold" rubber and the other was thereafter referred to as "hot" rubber. During the period 1948-52, cold rubber gradually replaced hot rubber as the rubber used for tire treads. As with hot GR-S, its plasticity specification was set by Rubber Reserve at about 50 Mooney, although the early commercial production was somewhat higher, in the range of 55-65 Mooney.

GX2516, par. 17 & 18 Baker, B6159-61
PX1129, p. 775

38. Depending upon the nature of the polymerization reaction, synthetic rubbers (particularly hot rubbers) characteristically contained gel structures in various amounts. Gel-molecules of rubber which are cross-linked in a manner somewhat similar to the vulcanization process was avoided where possible, because it often led to processing difficulties. One reason the polymerization process was not carried beyond about 70% completion was that the amount of gel increased rapidly beyond that point.[12]

DX1288, pp. 35-36 Semon, C3912-14, 3896
Alliger, C396 Swart, B7391-97

39. Neither natural nor synthetic rubber is useful in a tire tread unless it is mixed with a reinforcing ingredient. Further, in order to form a vulcanizable compound, sulfur

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12) There are two types of gel, macro and micro. Macro gel is the material left after rubber is dissolved in benzene and passed through a fine screen. The character of macro gel is further defined by a "swelling index" which is the percent of solvent which can be held by the gel. A gel having a swelling index of 50 or less is considered a "tight" gel. Gels with a higher swelling index could normally be made soluble by slight working on a mill. "Micro gel" is not caught on the gel screen.

(the vulcanizing agent) and chemicals such as accelerators (which speed up vulcanization) and antioxidants (which prevent oxidation and deterioration) are added. Except for the reinforcing ingredient, carbon black, none of these need be discussed in detail.

GX2516, par. 6 & 7

40. Carbon black is a standard ingredient added to tread compounds to improve certain important properties such as strength. Not all carbon blacks have this property. Those which do are called reinforcing blacks, the degree of reinforcement depending upon the surface area per unit weight and the structure of the carbon black particles.

GX2516, par. 7

41. Before 1940, the best available carbon blacks were the channel blacks, which in essence were lampblacks made by the incomplete burning of natural gas in close proximity to a cold metal channel (I-beam) upon which the black was deposited. One useful type of channel black was known as EPC (easy processing channel).

GX2516, par. 7

42. During World War II, furnace blacks began to be produced. These blacks, made by cracking natural gas in a furnace, had about the same particle size as the channel blacks, but had a different particle structure, were alkaline rather than acid, and were more difficult to work into the rubber. An inproved furnace black, known as Philblack O, was developed by Phillips Petroleum about 1946-47 and went into commercial use about 1948. Other things being equal, this black produced improved abrasion resistance over EPC in both hot and cold rubber tread recipes.

GX 2516, par. 7

43. Philblack O and blacks of this type made by others became known as HAF (high abrasion furnace) blacks. There are many commercial HAF blacks which can be used interchangeably. For example, Firestone uses Statex-R (Columbian Carbon Company), Philblack O (Phillips Petroleum Company), Aromex HAF (J. M. Huber Corporation), and Vulcan 3 (Cabot Carbon Company) all interchangeably.

GX2516, par. 7

44. Subsequent to the introduction of the high abrasion furnace blacks, reinforcing furnace blacks of smaller particle size came into commercial production. These became known as ISAF (intermediate super abrasion furnace) and SAF (super abrasion furnace) blacks. After 1960, HS and LS (high structure and low structure) furnace blacks began to be produced and used commercially. These types are designated by hyphenations, such as HAF-HS, HAF-LS, and ISAF-HS. Another type of furnace black used commercially, but not shown to be used for tire treads, is HMF (high modulus furnace) black.

GX2516, par. 7 & 34
Alliger, C436-37
GX2521, p. 17
GX2522, pp. 399-404
DX1288, pp. 245, 266

45. The amount and type of carbon black used depends upon the degree of reinforcement and other physical properties desired. With both natural and synthetic rubber, the amount of carbon black used in tread compounds was about 50 parts black to 100 parts rubber.[13]

GX2516, par. 7

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13) In rubber compounding, the proportions of ingredients are expressed in relation to 100 parts of rubber.

46. The preparation of a tire tread compound involves the mixing (compounding) of synthetic rubber made by the polymer plants with carbon black, sulfur, and other ingredients provided by other suppliers, under carefully controlled conditions. The determination of what ingredients to use, the proportions of each, and the mixing times, procedures, and equipment to use to obtain the desired product end properties and required manufacturing efficiencies is crucial to the commercial manufacture of tire treads. This determination is arrived at through an interplay of the factory manager, who has the responsibility for the actual mixing, and the research department, which is responsible for innovations. Situated between the research department and the factory manager is the product development compounder. He has both scientific training and practical experience, and he is the referee between research and the factory. His position is similar to that of a master chef; he has the final decision with respect to the use of new rubbers and other materials, and the combinations and proportions thereof. This man is the person to whom the patent in suit is addressed and his is the art against which the invention is to be measured. Of the witnesses who testified, Mr. Baker of General and Mr. Brandau of Firestone most nearly approach this man.

GX2682, tab 111	Alliger, C450-51
Baker, B506-08	Brandau, B10,340-43

47. In 1950, the exact nature of the interactions between rubber, carbon black, sulfur, and the other ingredients was not fully understood by either the laboratory researcher or the compounder. The skilled rubber compounder knew how to make a good tread compound but he did not know with certainty why it was good. As a

result, he was a very conservative person.[14] Based on past experience, the skilled compounder would not accept the suggestions of a laboratory chemist, unproved by actual road tests of tires made from the suggested composition. This was particularly true when the suggestions ran counter to the accepted expertise of his art. In short, the art of rubber compounding was not a precise or scientifically exact art.

Baker, B3883-88; 6155-71; 6642-47
Alliger, C299; 330-31

48. In processing rubber tire treads before World War II, as now, the machinery used in America normally consisted of Banbury mixers and mills (rolls). The basic techniques now used in the tire factories for handling or processing rubber, and from it building pneumatic tires, were also developed prior to World War II. These techniques did not change materially with the advent of synthetic rubber, cold rubber, and improved carbon blacks, nor with the advent of the invention of the patent in suit.

GX2516, par. 19-22, 35
DX1285
FX2739, pp. 11-15 & Exhibit A
B19,058-59
Niemeyer, B10,252-55

49. In a typical processing procedure just prior to the invention, the rubber and carbon black, with possibly some other ingredient (but none which would cause vulcanization) were worked in the Banbury for about four and one-half minutes at a temperature of about 300° F.[15] The

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14) If he were to make a mistake it might not appear for some months after the tires were produced, by which time the mistake would have been repeated in many tires.

15) The operating temperature of the mills and Banbury can be controlled by the flow of cooling water through cavities within the equipment.

Banbury mixer resembled a giant dough mixer in that it had intermeshing blades which counter-rotated within a closed housing. It was (and is) a massive and expensive piece of equipment, standing over one story high.[16] It commonly mixed single batches of about 400 pounds.

GX2516, par. 19
FX2739, pp. 11-15 & Exhibit A
Baker, B3650, 4516-17
GX2521, p. 118

50. The product as it came from the Banbury was called a masterbatch (a masterbatch being rubber plus some, but less than all, compounding ingredients). Upon removal from the Banbury, the masterbatch was formed into a sheet on a mill and set aside to cool. It was then passed to a second Banbury, where the remaining ingredients were added and mixed for about two and one-half minutes to form the final stock. These ingredients included sulfur and chemicals to aid vulcanization. It was also customary to add a small amount of a softening oil, usually about 5 parts by weight, to facilitate processing. This oil was usually added in two parts—one in the first Banbury mixing and one in the second.[17]

GX2516, par. 19
FX2739, pp. 11-15 & Exhibit A
Baker, B6155-71; 6493-6505
Weinstock, GX2680, pp. 117-118, 130-131

51. The mixing operation is delicate. The mixing had to be thorough so that all of the ingredients were blended

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16) A much smaller Banbury is used for laboratory mixing, of course.

17) With the advent of synthetic rubber, the amount of processing oil was generally increased to 8-12 parts, but it was kept as low as possible because of the compounder's fear of an adverse effect of the oil on the properties of the finished tire tread.

into a cohesive, homogeneous mass, yet this had to be accomplished at a temperature which would not scorch or prevulcanize the rubber and without excessive power demands or strain on the equipment. It also had to be done quickly, since excessive time spent in producing a batch could result in a commercially unfeasible procedure. For example, if the time required to mix a batch of rubber were doubled from six to twelve minutes, the practical effect would be that the plant capacity would be cut in half.

Baker, C5791-93
Brandau, B10,343

52. After cooling, the final stock was normally placed on a "warm-up" mill before further processing. A mill was a pair of large, smooth, metal rolls between which the rubber mixture was passed. One roll normally ran somewhat slower than the mating roll, thereby producing a pulling or shearing action on the rubber. The separation between rolls could be varied, and the width of separation determined how much work was done on the mixture; an open mill did practically no work, while a tight mill did considerable work.

GX2516, par. 19 — Baker, B601-04; 4544-48;
GX2521, "mill" — C5806-07

53. The warm-up mills and the mills used to form the Banbury batches into sheets (called "sheet-off" and "batch-off" mills) were set at an opening setting. Tight mills were used when ingredients were to be incorporated on the mill or when it was desired to soften the rubber by mechanical working.

GX2516, par. 9 — Baker, C5806-07

54. From the warm-up mills, the final tread stock was moved to the extruder, a screw-fed device provided at its exit end with a die of the proper shape, in cross-section, for the extrusion of a tire tread. The treads were extruded in a continuous strip and cut to the proper lengths on an angle so that the ends could be overlapped on the tire to form a smooth joint or "splice." Treads at this state were referred to as "green" treads and the compound at this stage was called a tread stock.

GX2516, par. 20 & 21 Baker, B639-46

55. The green tread was subsequently wrapped about a previously-constructed carcass and the assemblage (at that point resembling an open-ended drum) was called a "green" tire. In order to secure the tread splice, a cement composition was employed and the meeting ends of the tread were usually mechanically pressed (stitched) together.

GX2516, par. 21

56. The green tire was then placed in a mold and heated for a predetermined time, sufficient to vulcanize the tire in its final shape. The terms "vulcanize" and "cure" were used synonymously in the tire making industry.

GX2516, par. 22
GX2521, p. 28

57. Various tests were employed to determine the physical properties of the vulcanized rubber compound. The more important ones from the standpoint of this case were tensile strength, elongation, modulus, and hysteresis or heat build up. The American Society for Testing Materials (ASTM) has established procedures for these tests which are followed in principle by the various rubber

and tire companies. This organization is also the publisher of a "Glossary of Terms Relating to Rubber and Rubber-Like Materials."

GX2516, par. 8-12
GX2521

58. Tensile strength is measured by the pulling force required to produce rupture of a standard specimen.

GX2516, par. 8

59. Elongation is the percentage by which an original marked distance on a rubber specimen will increase under a given pulling force. Ultimate elongation is the percentage at the moment of rupture.

GX2516, par. 9

60. Modulus is the force necessary to produce a stated percentage elongation. For example, modulus at 300% is the force required to produce 300% elongation.

GX2516, par. 10

61. When rubber is deformed and released, it generates heat. This property, known as heat build-up or hysteresis, is an important quality in a tire tread because, even under normal driving conditions, treads are subjected to repeated deformations. The amount of rise in temperature depends on the hysteresis characteristics of the tread, which are a function of the rubber itself and the amount and type of other compounding ingredients, particularly carbon black. If the heat build-up becomes too great, it could cause a failure or blow-out of the tire; the lower the heat build-up, the better the tread, all other things being equal. Various methods of measuring heat build-up were employed, all involving repeated deformation of a vulcanized specimen of rubber. The Goodrich

Flexometer was widely used to measure the rise in temperature of a vulcanized specimen subjected to a prescribed number of rapid compressions in a specified time.

GX2516, par. 11 Semon, C4404-10

62. In summation, the conventional commercial manufacture of the tread portions of pneumatic tires at the time of the invention of the patent in suit was as follows: Butadiene-styrene rubber with a plasticity of about 50 Mooney was mixed with about 50 parts of carbon black and about 8-12 parts of hydrocarbon oil (both based on 100 parts of rubber) and mixed in a Banbury for a total of about seven minutes, then extruded to form the tread portion of the tire. The equipment, procedures, and times employed were basically the same as those that had been used for processing natural rubber prior to World War II.[18] The use of high Mooney rubber (90 Mooney and above) was avoided because it was too tough to process commercially into a tire tread or tread compound, even though it had been known from the early 1940's that its abrasion-resistant properties were superior. The use of amounts of oil beyond 8-12 parts was also avoided, even though it had been known for years that oil was a softener for rubber, because it was thought that more oil was incompatible with the maintenance of the high physical properties demanded of a tread rubber. It was in the context of this art that the inventors began their work.

GX2516, par. 19 & 22 Baker, B6493-97

FX2739, pp. 11-15 & Exhibit A C5790-91

Niemeyer, B.11,232-36

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18) The premastication employed to reduce the Mooney of natural rubber from 120 to about 50 was not needed since the synthetic rubber was of 50 Mooney to begin with. Such premastication was not a commercially feasible means of treating synthetic rubbers having a Mooney about 60 because they do not readily become more plastic as a result of such treatment.

The Invention.

63. The work which culminated in the invention of the patent in suit was initiated by the Ohio Rubber Company's request to Swart for assistance in developing a cheap compound for making rubber mats, such as automobile floor mats. This request was made sometime before March 15, 1949. Pfau, a former employee of Goodrich who had been recently hired to bolster General's research department (then consisting of no more than 15 technically-trained people), was assigned to this project by Swart by memo of March 21, 1949.

DX1044	Pfau, B709-11
DX1109	Weinstock, DX1367, pp.
Swart, B7279-80	.36-46, GX2680, p. 8

64. Since mat stocks did not demand high quality physical properties, Pfau first approached the problem by adding large quantities of oil (50 parts) and 50 parts of clay (a non-reinforcing filler pigment) to a butadiene-styrene rubber having a Mooney of 105. The theory of this approach, worked out by Swart and Pfau, was that:

> "The inherent strength and toughness of the high Mooney polymer plus its ability to absorb and retain the oil was expected to give a product of good strength and easy processability for application in such products as light colored floor matting."

DX1044	Pfau, B761-62
DX1048 (AO71785)	Swart, B7283

65. The work with clay proved to be a failure because the resulting compound was too soft and sticky to handle at curing temperatures. Nevertheless, work continued on this project, designated project number 104. Its objective

was stated to be the "addition of high oil loadings to high Mooney GR-S to give a cheap processable stock."[19]

DX1048 (AO49989) Pfau, B768-69

Swart, B7280-82 Weinstock, DX1367, p. 57

66. In June, 1949, the inventors added 100 parts of oil to a series of butadiene-styrene copolymers, ranging from at least 71 to 169 Mooney. Convinced by then that they would have to use a filler other than clay, the inventors added carbon black as a reinforcing filler (100 parts EPC). Surprisingly, good physical properties were obtained on these compounds, and the inventors "decided to work out a rubber/oil-black masterbatch since the largest potential market should be in the field where carbon black reinforcement would be essential."

CX1050 (AO75050) Pfau, B838-40

Weinstock, DX1367, pp. 63-68 Swart, B7283-84

67. In June or July, 1949, the inventors met with Mr. L. M. Baker and, based on the physical properties they had obtained, requested that he set up a road test to evaluate their compounds "as a tractor tread or as a second line passenger tire tread compound."[20] Baker was General's

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19) The patentee's work leading up to the filing of the patent application is largely reflected in Pfau's monthly progress reports beginning with the one covering the period April, 1949. The reports for April, 1949 through October, 1950 appear in DX1048-55, 1056-57, 1059-60, 1063-64, 1066, and 1068-72. Pfau testified that he was persuaded by Weinstock to include Weinstock's work on compounding in Pfau's reports and those reports do reflect at least a portion of Weinstock's work. Swart wrote no progress reports but kept a file of those prepared by his staff.

20) Passenger tires were rated as premium, first line, second line, or sometimes third line. The first line tire (also sometimes called a 100 level tire) was the standard quality, the one sold for original equipment on new automobiles. Second and third line tires were sometimes made and sold. The main difference in quality between first, second, and third line tires was the rate of tread wear.

Manager of Product Compounding and he was the person responsible for initiating, setting up, and evaluating road tests of new compounds, and the development and evaluation of improved tread compounds. Baker, a graduate chemist, was the man who had the responsibility for adoption of new tread compounds at General in this period—the referee between research and the factory referred to in Finding 46. In short, he was a good example of the man skilled in the art as of the date of the invention.[21] Baker turned down the inventor's request because General "did not have any particular need at that time for a second line tire."

Baker, B435-49; 498-507; 516-31; 2416-18; 6468-70

68. Work on evaluation of high Mooney rubber/oil/black masterbatches continued during July and August, 1949, with some difficulties, but with the result that very good physical properties were obtained from the compounds. During this period, the patentees had one or two further discussions with Baker. By August 15, 1949, with the help of Mr. Phillips, the man in overall charge of tire manufacturing, they had persuaded Baker to set up a development project designated by Baker as C-26. This project, entitled "Special Low Cost Wet Masterbatch for

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21) Baker had had extensive experience in development compounding. He had been in the tire industry since 1926 and had been involved in compounding since 1936. At Firestone, Baker worked on development compounding of passenger and racing tires. At Lake Shore he was in charge of tire compounding and construction. At Mansfield he was in charge of tire compounding. This work was prior to his coming to General.

Baker defines a compounder as a:

"qualified professional chemist who knows the behavior of rubber and the materials in rubber, and understands the processing and understands too, fairly well, what we need in the final products, and who can design compounds using the materials to get the kind of properties you want in the product and to have it process satisfactorily to make them economically."

Tractor Treads and Second Line Passenger Treads," was designed to evaluate the very high Mooney-very high oil masterbatches upon which the inventors had been working.

DX1051	Weinstock, DX1367, pp.
DX1052	66-74; 102-106; 125-29;
DX1102	GX2680, pp. 52-53; 79-
Baker, B2422-34	82; 85-86; 551-53
Pfau, B2649-52	
Swart, B7284-85	

69. Further masterbatches of varying high Mooney rubbers, oils, and carbon blacks were evaluated in September and October, 1949. In the fall of 1949, Weinstock combined the remnants of a number of these high Mooney masterbatches (none containing rubber of less than 150 Mooney and all containing at least 50 parts of oil) and, on his own time, took the compounds to the factory retreading shop where he made crude recaps for two of his own tires. These tires were run on his personal car in the Akron vicinity for about a month, during which time he took Pfau for a ride to demonstrate that the treads had normal traction on hills, and on wet and icy pavements. This "test" and the testimony of Weinstock and Pfau demonstrate that the inventors were aware that their suggestion to use their compounds for even second-line treads was radical, and that they were determined to verify for themselves, however roughly, that they were not advocating a position which would make them appear foolish before their colleagues.[22]

DX1053	Weinstock, GX2680, pp.
DX1054	92-93; 117-26; DX1367,
Pfau, B938-43	pp. 104-23

22) It was well known in the tire industry as that time that the ultimate test of a tread compound lay in actually making the tire and running it on an automobile for some thousands of miles to see what happened. Reliance on physical properties alone when evaluating a new material could be misleading.

70. Throughout November and December, 1949, work continued on selecting the proper amounts of oil and carbon black for the high Mooney rubbers Pfau was making. A relationship was noted between the plasticity of the rubber and the oil and carbon black loadings desirable for good processability and balanced physical properties. In some instances better physical properties were obtained by increasing the amount of oil used.

DX1056	Pfau, B909-925
DX1057	

71. In January, 1950, rubber in latex form and having a Mooney of approximately 160-200, obtained in 55 gallon drums from Polymer Corporation in Sarnia, Canada, was masterbatched with 50 parts oil and 75 parts carbon black and made into a tread stock in General's laboratory.[23] The physical properties of the stock were excellent and the results were taken to Baker on January 24 by Swart and Weinstock. Baker copied the data onto a sheet in his own hand and that same day, referring to the excellent properties he had been shown, he revised and upgraded the C-26 project to test the tires for premium rather than second line tire treads.

DX1059	Baker, B2447-56
DX1105	Pfau, B2683
DX1104	Swart, B7285-90
DX1106	

72. The experimental tires for this test (known as tire test 2614) were built in February, 1950, from a compound containing 60 parts oil and 85 parts carbon black to

23) As work reached the stage where factory evaluation was in order, larger quantities of rubber than could be conveniently made in the laboratory were required. Consequently, General obtained the polymer, made to its specification, from a commercial polymer plant in Canada.

100 parts of a butadiene-styrene rubber having a Mooney between 160-200. This test appears as Example 4 of the patent.

DX1060
DX1065
Baker, B2456

Weinstock, DX1367, pp. 139-42; 737-38; GX2680, pp. 130-32

73. It was intended that five tires be made for this test, but production difficulties caused three of the tires to be discarded.[24] Two tires were built, however, and sent to General's road test fleet in Colton, California, where the test was run, beginning March 22 and ending May 8, 1950. Preliminary results from this test (at 4,200 miles) showed that the test tires were 29% better in tread wear than the control tires which were made from the standard-Mooney hot-rubber recipe then in commercial use in General's premium tires. Some at General doubted this report and thought the test tires and the control had been mixed up, but oil extraction analyses performed by Weinstock on the treads proved that this was not so. At 12,600 miles, the test tires were still running 14% better than the controls and at 14,700 miles, when the test was discontinued because one of the control tires had worn smooth, the test tires were superior to the control in tread wear by 6%.

DX1060
DX1065
Pfau, B1072-73; 1223-27

Baker, B2456-72
Weinstock, DX1367, pp. 134-44; 686-88; 731; GX2680, pp. 373-76

24) It is not unusual in the rubber compounding art to have such initial production difficulties when working with a new material. Difficulties were encountered during the switch from natural to synthetic rubber, from hot to cold rubber, and from cold rubber to oil-extended rubber. Splice problems, that is, a tendency to a depressed area or sometimes to a hairline opening in the beveled joint formed by the joining of the ends of the tread as it is wrapped around the tire carcass are an example of one such problem.

74. The final report of tire test 2614 recognized that further work was needed before commercial production would be practical, but the improved treadwear of the test tires was recognized as extremely significant. The recommendation was that further work be "expedited."

DX1065

75. In March, 1950, the patentees prepared two batches of rubber coagulated from latices obtained at Sarnia, Canada. One rubber, having a Mooney over 160, was mixed with 70 parts of oil and 85 parts carbon black. The other, having a Mooney of 120 was mixed with 35 parts of oil and 75 parts black. Test tires were made from each of these batches and run on General's test fleet as tire test 2845 starting May 11, 1950. This test is reported in Example 5 of the patent.

DX1063 DX1067

DX1065

76. The final report on tire test 2845 (dated July 25, 1950) showed that the test tread made from the rubber having a Mooney over 160 was 18% superior to the standard cold rubber control tire in treadwear and that the test tread made from the 120 Mooney rubber was 24% superior in treadwear, both after 18,900 miles. As with tire test 2614, the test was stopped when one of the control tires became smooth. The report concluded that the treadwear of the test tires was "extremely remarkable" and that splice difficulties still required work. The report recommended that: "This performance is so remarkable and the quality and cost potentialities are of such magnitude that projects C-69A and C-26 (high Mooney—high oil treads) must be completed without any delays."

DX1067 (AO74704) Baker, B3633-43

77. Prior to the filing of the application for patent, other road tire tests were undertaken, including tire test 2914, a test conducted on tires made from a blend of a high Mooney oil masterbatch and ordinary Mooney rubber. This test is reported in Example 6 of the patent. Other tire tests were 2911 and 2930.

DX1116 Baker, B3667-76, 3732-34
DX1117
DX1125

78. During this time period the inventors initiated further studies with respect to the development of oil-extended rubbers for use in treads under arctic conditions, selection of plasticizers, solution of handling problems, and problems in characterizing the polymers whose Mooney was so high that it could not be measured accurately. This work is reflected in the monthly progress reports for the months of April to October, 1950.

DX1064 DX1068-72
DX1066 DX1077

79. The upshot of this work was the demonstration by the patentees that a quality tire tread could be made from the previously unusable high Mooney rubber by adding sufficient oil (and carbon black based on the rubber plus oil) to it to make it processable in the same time and manner as ordinary 50 Mooney rubber. While it had been known previously that oil could soften rubber and that high Mooney rubber was superior in physical properties, those skilled in the art did not think it possible to add the large amount of oil (and adjusted carbon black) needed to make high Mooney rubber (90-120 or higher) processable in the ordinary way and still maintain the high quality and properties demanded of tire treads since it

was well known that oil had an adverse effect on physical properties. Further, it was well known (and published) that adding either excell oil (over 10 parts) or excess carbon black (over 50 parts) or both, to ordinary Mooney rubber caused an impermissible increase in hysteresis or elongation; but the addition and interaction of both with the high Mooney rubber, in accordance with the invention, had the surprising and very desirable effect of lowering hysteresis. The inventors had thus shown that the compounder could have both the benefit of superior properties and easy processability at a drastic reduction in cost. Oil costs about two cents per pound while synthetic rubber costs about twenty-three cents per pound.

Findings 66-69; 81-88	Baker, B6155-73; 6493-505
DX1001	Weinstock, GX2680, pp. 117-118; 130-131
DX1288, pp. 2, 19-20	Niemeyer, B11,232-3
PX1221, tab A, p. 569	PX1036
	FX2595

Reaction to the Invention.

80. The reaction at General to the inventors' work was one of skepticism, at least until after road tests clearly had shown the quality of the high oil-high Mooney compounds. The inventors themselves had doubts, despite the good physical properties obtained. Well aware of the long-accepted belief that large quantities of oil should not be used in tire treads and afraid of appearing foolish for making the suggestion, they had made the rough, unofficial tire test on Weinstock's personal automobile as set out in Finding 69. Baker admitted to his skepticism of the project and agreed that the expression "Bottneck Baker" accurately described his initial attitude

toward setting up the project. Even at the stage where the test tires were being built, the inventors had difficulty in persuading, and in fact initially failed to persuade, the factory to add the quantities of oil required.

Weinstock, GX2680, pp. 79-82, 85-86
Baker, B4022, 6063, 6104-09, 6155-73

81. The initial reaction of others in the industry amounted to scorn. A high executive of U. S. Rubber Company (now Uniroyal) wrote General's president stating that he had "not yet bought the idea that mineral oil is rubber"; that he was "still wary of too much softener in tire treads"; and that in his opinion "the better the Bourbon, the less water you put in it."

PX1001, p. 324

82. The first reactions of Goodyear and Firestone were as emphatic. Mr. Vogt, Technical Superintendent of Goodyear, ridiculed oil-extended rubber for tire treads, telling Baker that he thought Baker had been in the rubber industry long enough to know that it was not possible to improve tread wear of tires by adding oil to the tread compound and that he was surprised that General would subscribe to that principle. Mr. Torrance, Chief Chemist at Firestone, told Baker he was also surprised that Baker would advocate oil-extended rubber tire treads.

PX1001, p. 321 Baker, B6099-6103

83. Perhaps most candid of all was the testimony of the compounder from Firestone (U.K.), Mr. Taylor, who testified on Firestone's behalf at the trial in England which involved the validity of General's corresponding U.K. patent and Firestone's infringement thereof. This testimony concerning the reaction to the announcement of General's invention is reported at pages 58-59 of the Judg-

ment of the High Court of Justice, Chancery Division, rendered June 29, 1970, as follows:

Q. "Did you find anything technologically surprising in the development, as opposed to economically"?

A. "Yes; I must honestly say that we were surprised that one could use such quantities of oil."

Q. "Such big quantities"?

A. "Yes. . . We had got so accustomed to the oil loadings we had used for many years, that one regarded the levels we were using of 5 or 8 parts as being the normal. 45 parts of oil of course seemed, you know, an astonishing amount to use, even if it was a high Mooney rubber."

GX2520, pp. 58-59

84. The initial skepticism and disbelief was quickly replaced by acceptance and adoption of the invention, however. All of the prior extensive work attempting to make high Mooney rubber processable for tire treads (such as heat softening and air Banbury breakdown) were promptly discontinued and never shown to be resumed. Firestone's answers to interrogatories show that by 1954, 95% of Firestone's passenger treads used oil-extended rubber.

GX2681, tab 31(b)
DX1288, p. 2
GX2516, par. 34
PX1221, tab B
DX1217
DX1272, tabs A-N
DX1249
DX1250
DX1252
B19,054-56
DX1080
DX1152, tab 45C
DX1254
GX2683, tab 136A, 138
GX2566
GX2567

85. In contrast to its early skepticism, Firestone's technical publication, SYNTHETIC RUBBER FACTS, published and distributed to the industry in 1958, after the invention but before the patent was obtained, contains several passages relative to the impact of oil-extended rubber treads. In its section on the history of synthetic rubber, Firestone lists the first production of oil-extended rubber in 1951 as among the "important dates in the history of synthetic rubber."

DX1288, p. 23

86. This Firestone technical publication also described the advantages of oil-extended rubber treads, as follows:

"In 1951 production of oil-extended rubber was begun. This type of rubber is a homogeneous mixture of high Mooney (120 ML4 or higher) base polymer and a petroleum oil (usually 25 or 37.5 parts per 100 parts of polymer). The resultant material has a Mooney viscosity in the normal range (e.g., 45 to 60 ML4). It had been known for some time that high Mooney polymer had superior tread wear resistance, but this property could not be exploited because of the difficulty of processing the polymer. Oil-extension corrected this difficulty, making available a new and useful polymer type. Advantages of oil extension may be summarized as follows:

1. Satisfactory processability of very high molecular weight polymer permitting utilization of the desirable properties of this type of rubber,
3. Improved tread-wear and tread-crack resistance,
3. Lower cost or rubber,

4. Greater production of rubber from a given amount of monomer,

5. Improved hysteresis characteristics."

DX1288, pp. 19-20

87. It further described the impact of oil-extended treads as follows:

"In order to utilize the advantages offered by excessively high Mooney viscosity polymers, and to process these polymers on available rubber equipment, it was necessary to incorporate large amounts of processing oils. The addition of these oils decreases treadwear. However, this is more than compensated for by the increased wear from the higher Mooney polymer.

"Since the introduction of cold rubber and oil-extended cold rubber as replacements for natural rubber, the performance of passenger treads has been so outstanding that these polymers have become the standard of the industry."

DX1288, p. 271

88. In its U. S. Patent No. 3,019,207, filed in 1956, Firestone further extolled the virtues of oil-extended rubber for tire treads as follows:

"Oil-extended synthetic rubbers, especially oil-extended GR-S, have become very popular in recent years for a number of reasons. The oils employed commercially are much cheaper than the synthetic rubber itself, so that the oil-extended synthetic rubber is produced at a saving over the straight synthetic rubber. Since the oil employed for extension of the rubber acts as a plasticizer for the rubber, it has been

customary to employ stiffer synthetic rubbers for oil-extension than are employed in the absence of oil. For example, commercial GR-S has usually been manufactured with a Mooney plasticity of about 50 to 60 for use without oil-extension, whereas the GR-S employed for producing oil-extended polymers usually has an initial Mooney plasticity of at least 85 or 90, and generally exceeds 125. Tire treads produced from the oil-extended rubber of such high initial Mooney plasticity have exhibited very good abrasion resistance, *the wear ratings being much higher than would be predicted from a consideration of the diluting effect of the oil on the rubber.* Thus, the practice of utilizing oil-extended GR-S for tire treads has become very popular in recent years." (Emphasis added.)

DX1831

89. This Court must agree with the cogent remarks of Mr. Justice Graham, speaking for the English Court in reference to Firestone's Synthetic Rubber Facts Book (see Finding 83), that:

"It is indeed unusual, if not unprecedented, to find in a patent action such a tribute from a defendant to the excellence of a plaintiff's product and process."

GX2520, p. 60

90. It is clear that the work of Pfau, Swart and Weinstock constituted an extremely important contribution to the advancement of the tread compounding art and the tire making industry generally, and that its success was unobvious and surprising to those skilled in the art.

The Claimed Invention.

91. The claimed subject matter of the patent in suit is an article of manufacture, in two forms. One form (claims 1-12) is a vulcanized pneumatic tire, and specifically the tread portion of the tire. The other form (claims 13-22) is a vulcanizable (but unvulcanized) tread stock, this article being a tread slab which has not yet been applied to a tire carcass.

DX1001 **DX1028-31**

Baker, B636-38

92. The unusually exacting characteristics and qualities required of the article of manufacture are set out in the patent as follows:

> **"... the rubber characteristics or qualities for tire treads are exacting and difficult to meet. Tire treads must be of uniform weight and cross-section; they must wear well and resist cracking both due to flexing and light; they must have substantial tensile strength and toughness. These qualities are had only in rubber compounds of the highest quality. Only highest quality rubber compounds are therefore used for good tires whereas in mechanical goods and especially in rubber footwear cost per unit of compound weight and not quality is the controlling factor."**

DX1001, Col. 1, lines 39-49

93. The patent goes on to describe other essential characteristics of the article of manufacture as follows:

> **"Even though quality is of prime importance in tires, it is essential that tires be capable of being made in volume and to make tires in volume it is necessary that the rubber compounds used be capable of extrusion**

through an orifice (including calendering which is, in fact, extrusion through a die having rotating sides). It is only by such extrusion processes that tire treads have been made in volume and with uniformity."

DX1001, Col. 1, lines 50-57

94. The foregoing volume production of high quality tire treads according to the invention is said in the patent to be performed utilizing "the usual rubber machinery," and processing the tread compound "in the very short time commensurate with ordinary procedures" then in use for the ordinary commercial synthetic rubbers (which were about 50 Mooney). This ability to formulate the tread in such a way as to enable the compounder to use the ordinary equipment, times, and procedures is extremely important, since a decrease in production capacity or the requirement of huge capital outlays for new or additional equipment would be prohibitive to the adoption of a new compound.

DX1001, Col. 1, lines 29-34;
Col. 4, lines 34-43
Brandau, B10,343

95. According to the invention, a high quality tire tread capable of being produced in commercial volume in the ordinary equipment, times and procedures used to process 50 Mooney rubber and at substantial savings in material costs comprises the novel interacting combination of:

(a) a tough butadiene-styrene synethetic rubber having a Mooney of at least 90. This rubber was previously known to be superior in physical properties, but considered unusable for making tire treads because it was too stiff and tough to work on the or-

dinary equipment[25] and, therefore, the essential ingredients such as carbon black could not be uniformly mixed into the rubber within the normal times demanded for commercial production.

(b) a large quantity of softening oil (at least 20 parts) incorporated into the tough synthetic rubber in an amount sufficient to enable the rubber to be processed into tire treads on ordinary equipment, in ordinary times, and using ordinary procedures. That is, no special treatment such as heat softening or long mechanical working would be required. It was previously known that oil could soften rubber, but it was considered that the large amounts necessary to make tough rubber processable without additional treatment would so deteriorate the physical properties of the rubber that it would be useless for tire treads.[26]

(c) a reinforcing agent (carbon black in practice) added to the compound in conventional amounts, considering the rubber-oil mixture as all rubber. This carbon black could be uniformly mixed throughout the oil-rubber tread compound in the same equipment, time, and manner as if using ordinary 50

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25) It was known that these tough synthetic rubbers could be softened by subjecting them to long periods of mastication (mechanical working), or to long periods of heat softening, or a combination of the two. This procedure destroyed the inherent superior properties of the rubber and required expensive additional equipment and long processing time, however, and was thus not technically advantageous or economically feasible. The result, as pointed out in the patent was that:

"It was reasoned and generally believed that inasmuch as the rubber necessarily had to be plasticized or broken-down for factory processing that one might just as well start with a highly modified or soft rubber in the first instance and obtain the same end product."

26) Large amounts had been added where quality was not important such as in the production of adhesive and cheap molded goods.

Mooney rubber. Thus, any deterioration in the starting rubber resulting from this necessary mixing action would be no more than that resulting from the prior art mixing with 50 Mooney rubber. In this combination, the retained superior properties of the high Mooney rubber would more than offset the deteriorating effect of the oil, resulting in a high quality end product at much lower cost.

DX 1001	Alliger C294-95
Findings 62; 73; 79-83; 86-88; 176-77	Weinstock, GX2680, p. 54
PX1114A	PX1221, tabs A & B

96. Blends of rubbers are covered. Some claims are directed specifically to cold rubber (claim 7); to an oil of a particular boiling point (claim 5); to a minimum oil content of 30 parts (e.g., claim 19); to a minimum rubber toughness of 115 Mooney (claim 22); and to a characterization of the rubber toughness based on a test requiring a mixing of oil, rubber, and carbon black (claim 1). These will be analyzed specifically in connection with the findings on infringement, but it is not necessary to treat them specifically here since General does not rely upon the narrower claims to distinguish over the prior art.

DX1001

Infringement

97. Since December 13, 1960, the date of issuance of the patent in suit, Firestone has made substantial quantities of curable rubber tread stocks from three representative formulas which were designated in this case as Stock A, Blend 2, and Blend 5. These stocks also were applied as the tread portions of pneumatic passenger tires commercially manufactured by Firestone. The three

formulas for the stocks expressed in parts by weight are as follows:

Source of Rubber	Stock A	Blend 2	Blend 5
FR-S 184	96	60	82
Diene 35	—	20	—
Diene 55	—	20	—
FR-S 1500	—	—	18
Other Rubber[27]	4	—	—
Total Parts of Rubber	100	100	100
Parts of Oil Supplied by FR-S 184	36	23	31
Parts of Oil Supplied at Banbury	0	20	0
Total Parts of Oil per Hundred Parts of Rubber	36	43	31
Parts of Black and Type	55 ISAF	68 ISAF	65 HAF

The formula for each of the above stocks also contains other ingredients such as sulfur, accelerators and the like. The exact composition and amounts of such ingredients are considered to be trade secrets by Firestone, but disclosure of this detailed information is agreed by Firestone to be not necessary for the purposes of this litigation.

GX2516, par. 33 and 34
GX2681, tab 31(b)

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27) Firestone makes no point of the "other rubber" content of any tread stock on the issue of infringement.

98. The material, FR-S 184, in Stock A, Blend 2, and Blend 5 was (and is) a regular commercial product of Firestone manufactured by copolymerizing, in an aqueous emulsion system at a temperature of about 41° F. (a), a latex of a synthetic rubbery copolymer of butadiene and styrene containing more than 50% by weight of butadiene, and (b) an aqueous emulsion of a hydrocarbon mineral oil obtained from petroleum. The latex and emulsion were (and are) proportioned so that FR-S 184 contained 37.5 parts by weight of such oil and 100 parts of the rubbery copolymer.

GX2516, par. 25 GX2517
DX1288, pp. 57, 74

99. The copolymer contained in FR-S 184 was a "cold" rubber with a relatively long chain molecular structure. It was compatible with hydrocarbon mineral oils. It was substantially gel free as determined by normally used industry tests, and it was non-oil resistant in accordance with the classification usually made in the rubber industry of oil-resistant versus non-oil resistant (based on the relative resistance of vulcanized compounds made from the rubbers to swelling in hydrocarbon oils).

GX2516, par. 25-29
DX1288, j. 251

100. The Mooney viscosity (ML-4 at 212° F) of the contained copolymer in the latex for FR-S 184 was rigidly controlled by Firestone. Such control included taking regular samples of the latex as it was made, coagulating it (without adding oil) and measuring the Mooney viscosity of the rubber coagulum.

DX1288, pp. 271-2
GX2517

101. As a part of the discovery in the Baltimore case, Firestone supplied General with a representative sample of the copolymer contained in FR-S 184 that had been coagulated without adding the oil. Two measurements of Mooney viscosity were made by General on two different portions of the sample, and the readings were 116 ML-4 and 117 ML-4. Firestone made no Mooney measurements on a portion of the sample it had retained.

DX1353 Meyer, B11,814-18; 12,309

102. It has been stipulated by the parties that the samples of FR-S 134 latex used for Mooney determinations were coagulated by a method which in fact differed from, but for the purposes of this case may be considered to be the same as, the method used in the commercial co-coagulation of the latex and oil emulsion.

GX2517

103. Firestone has stipulated that the Mooney viscosity readings on at least some of the samples of rubber coagulum from FR-S 184 latex were above 90 ML-4 at 212° F. The evidence as to particular samples ranged from about 95 to 117 ML-4. Firestone's expert witness, Dr. Semon, desired samples of the contained polymer in FR-S 184 for test purposes to be as near 91 ML-4 as possible, but none that low was obtained for him.

GX2517 Meyer, B11,814-18; 12,309
DX1353 Semon, C4274-75; 4456-57
GX2595-97

104. The Mooney viscosity of the FR-S 184 oil masterbatch was never below 40 ML-4. Since FR-S 184 has always contained 37.5 parts by weight of a typical rubber softening oil, the Mooney viscosity of the contained rub-

bery copolymer must always have been above 90 ML-4, according to charts prepared by Firestone's expert, Dr. Semon. The median Mooney range for FR-S 184 specified by Firestone is 45 ML-4, corresponding to a Mooney reading of about 102 for the contained polymer according to the Semon chart. The Court findings that the contained copolymer in FR-S 184 as made by Firestone since December 13, 1960, meets the Mooney requirements of claims 13, 14, 17-19, and 22.

DX1288, p. 74 Semon, C4441-43
FX2865

105. Another portion of the sample of the copolymer in FR-S 184 supplied by Firestone (Finding 101) was mixed by General's personnel with 65 parts by weight of Philblack O (a high abrasion furnace black) and 30 parts by weight of Sundex 53 (a hydrocarbon oil).[28] The mixing procedure used was that described in lines 3 to 30 in column 7 of the patent in suit. Mooney viscosity measurements made by General on the mixture gave values of 80.5 ML-4 and 81 ML-4. No one from Firestone observed the mixing and Mooney measurements, but Firestone made no such mixtures or Mooney measurements itself on this sample of FR-S 184. A series of similar tests run by Dr. Semon for Firestone in 1969-70 on samples of what was alleged to be commercial production runs of the copolymer in FR-S 184, when mixed with high abrasion furnace black and hydrocarbon oil, resulted in compounds having a ML-4 of 85. The Court finds that the contained polymer in FR-S

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28) Claim one (and the claims dependent thereon) characterizes the toughness of the polymer by a test which involves mixing 100 parts of the polymer with 65 parts of a "high abrasion furnace carbon black" and 30 parts of a "hydrocarbon oil." If the mixture has a compound Mooney over 60, the toughness test is met.

184 as made by Firestone since December 13, 1960, met the Mooney requirements of claims 1, 3-5, and 7.

DX1353	Meyer, B11,822-29; 12,153-54
Semon, C4269-74	Irons, B12,516

106. Diene 35 and Diene 55 in Blend 2 were rubbery polymers of butadiene manufactured by Firestone to have measured Mooney viscosities of 35 and 55 ML-4, respectively. FR-S 1500 in Blend 5 was a cold, butadiene-styrene rubber made by Firestone having a typical Mooney viscosity of 50 ML-4.

GX2516, par. 38

107. 82.7 parts by weight of FR-S 184, 20 parts of Diene 35 and 20 parts of Diene 55 (corresponding to the proportions of the rubber constituents in Blend 2) were mixed by General's personnel with 7 parts of Sundex 53 (23 parts of hydrocarbon oil being present in the 82.7 parts of FR-S 184) and 65 parts of Philblack O as described in lines 3 to 30 in column 7 of the patent in suit except that the oil already contained in FR-S 184, of course, was not added during the mixing. Mooney measurements on the mixture gave readings of 70 ML-4 and 71 ML-4. The FR-S 184 was purchased by General from Firestone through regular commercial channels. No one was present from Firestone during the mixing or taking of measurements nor did Firestone duplicate this test. No contradictory evidence was offered and the Court finds that this blend satisfied the Mooney requirements of claims 1, 3-5, and 7.

DX1359	Meyer, B11,851-66; 12,322-24

108. 110 parts by weight of FR-S 184 and 20 parts of FR-S 1500 (corresponding to the proportions of rubber

constituents in Blend 5) were mixed by General's personnel with 65 parts of Philblack O (31 parts of hydrocarbon oil being present in the 110 parts of FR-S 184) as described in lines 3 to 30 in column 7 of the patent in suit except that the oil already contained in FR-S 184, of course, was not added during the mixing. Mooney measurements on the mixture gave readings of 72 ML-4 and 73 ML-4. The FR-S 184 was purchased by General from Firestone through regular commercial channels. While no one from Firestone was present during the mixing and taking of measurements, Firestone itself has not prepared such a mixture nor measured its Mooney viscosity. No contradictory evidence was offered, and the Court finds that this blend satisfied the Mooney requirements of claims 1, 3-5, and 7.

DX1359 — Meyer, B11,851-61; 11,869-71; 12,322-24

109. A representative sample of the hydrocarbon mineral oil used in FR-S 184 was produced by Firestone to General during discovery. General's personnel ran a standard boiling point test on a portion of the sample, and it did not boil prior to reaching a temperature of above 450° F. No one from Firestone was present during the test. However, Firestone has not performed this test itself even though a boiling point determination is a very simple test. The Court finds that said hydrocarbon oil had a boiling point over 450° F.

Meyer, B11,778-85
Alliger, C470

110. The oil used in Blend 2 supplied at the Banbury mixer is a hydrocarbon mineral oil derived from petroleum. Firestone purchased this oil from several suppliers, and it used such oils from different sources interchangeably. The

added oil in Blend 2 was not different from that used in FR-S 184 in any respect here material.

Brandau, B10,500-02; 10,519-20; 10,532-33

111. HAF and ISAF are recognized commercial types of carbon blacks that Firestone used in making Stock A, Blend 2 and Blend 5. Firestone used HAF in these tread formulae from several manufacturing sources interchangeably, and the same was true with respect to ISAF, but HAF and ISAF blacks were not used interchangeably. HAF and ISAF were (and are) both reinforcing furnace blacks of very fine particle size.

GX2516, par. 7, 34 & 36

112. The procedure followed by Firestone in compounding Stock A, Blend 2 and Blend 5 is schematically shown in DX1285. This same procedure was employed by Firestone for making tread stocks prior to 1949 when it used normal viscosity rubber of about 50 ML-4 instead of FR-S 184. Stock A, Blend 2 and Blend 5 tread stocks were made in standard equipment and in the usual periods of time.

GX2516, par. 35
DX1285
Brandau, B10,571-74
B19,058-59
Niemeyer, B10,252-55

113. The contained copolymer in FR-S 184 was not worked any longer than that minimum time necessary to incorporate the carbon black and other ingredients into 50 ML-4 rubber prior to the invention, and was thus substantially unmasticated, undegraded, and not substantially broken down.

GX2516, par. 35
DX1285
DX1288, pp. 211, 325
Niemeyer, B10,252-55
B19,058-59

114. Cold FR-S rubbers undergo practically no change in Mooney during working on standard rubber equipment in the usual periods of time.

DX1288, p. 325

115. Firestone has conceded with respect to the issue of infringement that tread stocks designated Stock A, Blend 2 and Blend 5 had Mooney viscosities between 30 and 70 ML-4 (as required by claim 13) and between 40 and 80 ML-4 (as required by claims 14 through 22).

GX2516, par. 39

116. The pneumatic tires manufactured by Firestone having tread portions made in accordance with Stock A formula infringe each of claims 1, 3-5, and 7 of the patent in suit.

117. Curable rubber tread stock manufactured by Firestone in accordance with Stock A formula infringe each of claims 13, 14, 17-19 and 22.

118. The pneumatic tires manufactured by Firestone having tread portions made in accordance with Blend 2 formula infringe each of claims 1, 3-5, and 7 of the patent in suit.

119. Curable rubber tread stocks manufactured by Firestone in accordance with Blend 2 formula infringe each of claims 13, 14, 17-19, and 22.

120. The pneumatic tires manufactured by Firestone having tread portions made in accordance with Blend 5 formula infringe each of claims 1, 3-5, and 7 of the patent in suit.

121. Curable rubber tread stocks manufactured by Firestone in accordance with Blend 5 formula infringe each of claims 13, 14, 17-19, and 22.

VALIDITY

The Status of Alleged Prior Art References as Prior Printed Publications.

122. In its Notice pursuant to 35 U.S.C. 282(4), Firestone has listed some 162 prior art references, 144 of which have been offered and received in evidence either in Cleveland or Baltimore. The status of 51 of these exhibits as prior printed publications has been challenged by General. Thus, before going further, the Court will consider this question.

(Notice (36,799)

123. During World War II and subsequently, when the U. S. synthetic rubber industry was under the ownership and control of the Government, certain agreements were entered into between the Government and the operators of its synthetic rubber plants which included provisions for the exchange of technical information among the parties to the agreements and, in certain cases, to others who, in the Government's opinion, needed the information in order to carry out the Government programs. These agreements are described in more detail in the findings under "license" *infra*. One means of this exchange of technical information was by way of reports prepared by various participants and known as CD Reports (Copolymer Development). Firestone has designated twenty-seven CD Reports as prior printed publications. These include: PX1034; PX1069; Px1197A (PX1197 Tab II); PX1203; PX-1219; PX1564 (FX2815); PX1745 Tabs A-C and Tabs E-II; PX1746; PX1748-50; PX1752; PX1761; PX1821-27; and FX2846.

DX1404
PX1202, tab A
PX1241, Operating Agreement Greer, C696-98
DX1430
DX1413B

124. The CD Reports were not available to the public. Their distribution was according to a fixed and limited list of recipients and subject to the secrecy and confidentiality provisions of the agreements between the government and participants in the government program. Section 8 of one such agreement (General's Operating Agreement) is illustrative. It provided that:

> "All such technical information shall be maintained secret and confidential and Operator shall establish and maintain all reasonable safeguards, including secrecy contracts, to prevent any disclosure thereof to any third parties without the prior written consent of Reserve."

Indeed, not every participant in the rubber program was privy to all technical information. General, for example, though a plant operator, was not authorized to receive certain CD Reports dealing with non-GR-S information, nor was it authorized to receive CR Reports (Copolymer Research). A limited and restricted distribution such as this is not "publication."

DX1413B	DX1222-23
DX1430	PX1241, Operating Agreement
DX1404	Greer, C700-05
FX2546-47	Soday, C3458-60
FX2878	Taft, B30,437-39
DX1605	D'Ianni, B17,774-79
GX2553	

125. Another group of government-connected technical documents designated by Firestone consists of AU (Akron University) Reports. They are reports of work done at the government laboratories at Akron University. There is no evidence, however, that these documents enjoyed even the limited circulation of the CD Reports. No

distribution list for AU Reports was offered. The AU Reports, in question, PX1197 tab I, PX1747, PX1751, PX1758, were merely found in the files of Rubber Reserve after the initiation of the present law suit. Two other technical reports of Rubber Reserve technical committees, PX1900 (PX1901) and PX1753 (PX1198 tab D), are designated by Firestone. Although circulated to committee members, they contained "technical information" in connection with the operation of the government synthetic rubber program, and hence were subject to the same restrictions of secrecy and confidentiality as the CD Reports. The information contained in the AU and committee reports was not available to the public and the reports were not published.

FX2878 — Laundrie, B29,573
Taft, B30,622-24

126. Firestone further relies on six reports of tests conducted by the government Tire Test Fleet as constituting prior printed publications. PX1109 (DX1349), PX1110, PX1111A (PX1111 tab B), PX1114, FX2553, FX2556. Tire Test Reports, like CD Reports, were mimeographed and distributed to a fixed and limited number of participants in the government synthetic rubber program. Like the CD Reports, they were subject to the same restriction of secrecy and confidentiality as set out in Section 8 of General's Operating Agreement (See Finding 124). Further, each textual page of the reports bears the legend "RESTRICTED" at both its top and bottom, and the title page of each report carries the following warning:

> "The information and data herein reported are the property of Reconstruction Finance Corporation, Office of Rubber Reserve. This report shall not be copied, duplicated, or its contents in any manner used for sales or advertising purposes. Any abuse will result in the cancellation of the privilege of receiving these reports."

There is no evidence that the contents of these documents were available to the public. They were not published.

PX1133 Blakeney, C4537-38

127. A large collection of technical information came into the possession of the United States as a result of its occupation of German territory at the end of World War II. This information included unpublished German and Austrian patent applications and correspondence and reports of German industry. Over 900,000 microfilm frames of these captured documents eventually found their way into the United States Library of Congress. Firestone has designated six pieces of this microfilm technical information —PX1725 (FX2828), PX1727, PX1728 (FX2831), PX1729 (FX2834), PX1930 (FX2826), and PX1946 (FX2848A)— as printed publications. Since reproduction by microfilm is not "printing," these German references fail as printed publications. Even if one were to consider them as being printed, they fail as anticipations because the microfilmed material itself was not publicly distributed. Instead, a list of the titles of the microfilmed material was published as the Bibliography of Scientific and Industrial Reports (BSIR). The material was so poorly indexed, however, that it was virtually inaccessible to a researcher. Further, many frames of microfilm are poorly made and difficult to reproduce or read accurately. (See, e.g., PX1946.)

PX1908 Green, B34,535-38; 34,558-60

128. Two other German-language documents (FX2851 and 2852) have also been cited as prior printed publications. These unbound materials were allegedly found in folders in an English library some time after the commencement of this litigation. No evidence or testimony as to their authenticity is before the Court. These references

are not printed nor is there any evidence that their contents were ever published or made available to the public prior to November 20, 1950. (See Colloquy at C5582-83.)

129. Another group of alleged prior publications is certain sales material of the Wilmington Chemical Company. These documents, PX1973 and FX2717, were distributed to several individuals in the rubber industry. Each, however, was marked "Confidential" and was mimeographed. The Court finds no sufficient evidence that these documents were published, much less made freely available to the public, prior to November 20, 1950.

Osberg, B37,981

Prior Art Patents, Publications and Alleged Publications.[29]

130. The Court finds that no one of the 144 or so items of patented or published prior art cited against the patent anticipated General's invention.[30] Separate findings are made hereunder with respect to those items upon which Firestone places primary emphasis. The others have been considered in groups, particularly where, as in many instances, there has been no real controversy as to what is taught by that art.

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29) In this section of the Findings, items of cited prior art which the Court has found not to be "printed publications" (hereafter designated with a "D" for "disputed") are nevertheless considered as if they meet those statutory requirements in order to simplify appellate review.

30) The number of references alone is some evidence of invention since the array of references relied upon by Firestone was available to the art but had not brought forth the advance claimed by General. Most of the printed publications here relied upon are from the widely read technical publications of the rubber industry such as Rubber Age, India Rubber World, and Industrial & Engineering Chemistry. Thus, the men skilled in the art had actual as well as constructive knowledge of most of the publications and patents relied upon by Firestone.

The Rostler Art.

131. This art consists of a British patent, several publications, and alleged publications, sales brochures and advertisements, and an alleged prior use, all involving Dr. Rostler. Dr. Rostler, a chemist, came to this country in 1938 to exploit the thesis he had developed at the University of Vienna. This thesis involved the recovery and use of complex materials derived from petroleum refinery waste products to which he gave the tradename "Naftolen." In 1942, with the financial backing of Francis I. duPont, Rostler formed the Wilmington Chemical Company for the purposes of manufacturing and selling Naftolen.

PX1567	Rostler, C3117-20; 3157
PX1973 (PX1218)	PX1990
PX1988 tabs A-F	FX2717 (PX1971)

132. Rostler's technical experience and business activity were in the art of oils and oil refining. His chief intended use for Naftolen, however, was as a compounding agent for rubber. It was Rostler's theory that Naftolen, being derived from the heavy sludge wastes of petroleum refining, was not a mere softener or plasticizer for rubber, but was of a special rubber-like nature and was capable of co-vulcanizing or chemically combining with rubber. This co-vulcanization theory was disproved by work done at Goodyear, however, and by 1948 the Wilmington Chemical Company was bankrupt and out of business.

PX1567, p. 2, lines 5-16
DX1580, pp. 3-4
DX1217, pp. 8-9
GX2608, pp. 7-8
Rostler, C3121
Osberg, B38,239-41; 38,245-47
Irons, B38,180
Baker, B6618-19; 7133-34

133. Rostler's British Patent 586,973 (H.W.K.Jennings declarant for Wilmington Chemical Corporation) issued April 9, 1947.[31] This patent is based upon an American patent application filed by Rostler on January 6, 1943, and later abandoned. In General's suit to obtain the patent (Finding 19), the government cited this patent as its most important reference. Judge Holtzoff said (and this Court agrees):

> "There is no doubt that the Jennings patent discloses in a general way the use of oil in the manufacture of synthetic rubber, but it cannot be said to point directly to the invention involved in this case and, therefore, cannot be deemed to be an anticipation. It must be emphasized that the Jennings patent does not refer to tough rubber as being one of the vital elements of the invention. It does not indicate any definite degree of toughness of the rubber to be used, nor is it limited to large quantities of oil. Moreover it does not show any advantages to be derived from the use of a large quantity of oil."

PX1567
PX1587
184 F.Supp. 344, 349

134. British Patent 586,973 deals basically with the method of extracting Naftolen from petroleum sludge. No invention in tires or tire treads is described or claimed. No procedures, times, compositions, or Examples for making a tread compound or any other compounds are given. It gives two Examples in which Naftolen is mixed with synthetic rubber. Example one deals with nitrile rubbers and example two with butadiene-styrene rubbers. The patent

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31) Item 1 of the prior art listed in Firestone's 282 notice in this case. These item numbers are those assigned by Firestone in its pre-trial brief.

describes all synthetic rubbers generally as being "dry and tough"[32] compared to * * *.

135. Firestone argues that because of the single reference to "Buna S" appearing in British Patent 586,973 (page one, line 42) the rubber of the examples must have been high Mooney German rubber. The following facts are contrary to this construction:

(a) The term Buna S is used in the patent as an incidental historical reference, not as a reference to the rubber used.

(2) The rubber used in Example 2 is described as a "commercial" latex. In the context of the patent (which is identified on its face as being based on a communication from the U.S.) this reference is to the commercial U.S. rubber which had a standard Mooney of about 50 and was also known as Buna S at that time. The German commercial latex was called IGETEX, not Buna A.

The Court finds no statement or teaching in the British Patent with respect to the toughness of the rubber to be used, nor with respect to Example 2 the amount of oil to be used. Firestone argues that the oil emulsion used in Example 2 must be the same as that used in Example 1, but this is not stated in the patent; it must be inferred. The British Patent does not anticipate or teach the invention of the patent in suit.

PX1567
DX1752, pp. 1, 27-28
PX1221, p. 568
GX2516, par. 14
GX2522, p. 956

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32) Wilmington Chemical Company's Technical Bulletin No. 3, dated October 8, 1943, states:

"Buna S, as it is available today in the form of GR-S and commercial varieties, is inherently a dry, tough, non-tacky polymer, difficult to process."

136. The other Rostler reference ("D") deserving mention is a Wilmington Chemical Company report dated February 18, 1943, entitled "Report on an Investigation of Naftolen-Modified Rubbers of the Buna S type."[33] This report was used as a sales aid for Naftolen. The reference has all of the defects of the alleged Wilmington prior use, discussed *infra*. It has no disclosure of the Mooney of the rubber or of tire treads having ever been made. It conclusively shows, by Rostler's own test of processibility (p. 4) that the rubber was of such low Mooney that it processed satisfactorily with only 10 parts of oil—the same amount used with 50 Mooney rubber. It could not, therefore, have had any substantially higher Mooney. This document was before Judge Holtzoff, but was not offered as a prior art reference. Even if a publication, this reference does not anticipate or teach the invention of the patent in suit.

PX1973 (PX1218) Rostler, C3197
DX1393

137. The Court has considered the various other Firestone references which involve the work of Dr. Rostler. None carry the case any further than those discussed above. The Rostler references do not anticipate or teach the invention of the patent in suit.

The German Art.

138. Firestone's primary reliance is placed on a four-part *Summary Report on the Production and Performance of German Synthetic Tires and Other Transportation Items.* Part I appeared in the August, 1945 edition of the widely circulated publication Rubber Age and Part II in the Sep-

33) Item 12 in Firestone's 282 Notice.

tember, 1945 edition.[34] This Summary Report was the end-product of an extensive on-site investigation of captured German plants conducted by teams of technicians from Firestone, Goodyear, U. S. Rubber, Goodrich, and others from the American, Canadian, and English rubber industries. Part I of the Summary Report contained the following general conclusions of the investigating teams:

(a) German Buna S tires are no better and probably not as good as American GR-S tires (p. 565).

(b) To obtain adequate tire mileage, vehicle loads and speeds had to be reduced (p. 565).

(c) The German Buna S supplied by the polymerization plants was very tough and required heat softening prior to the mixing of the compounds on mills or in Banburys (p. 566).

(d) Despite the additional heat softening operation and the use of higher softener, it had been found necessary to decrease mixing equipment speeds and to use longer times of mixing, resulting in extremely low efficiency as compared with American methods (p. 566).

Among the disadvantages of the German system, it was noted that in addition to the heat softening it was necessary to add larger amounts of softeners despite the fact that "It is known that high softener content adversely affects quality." (p. 569) Another disadvantage noted was that "The workability [of the Buna], however, depends upon long mixing cycles; and it is felt that it could not be adapted to our short batch times." (p. 571)

PX1221, tab A

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34) Item 26 in Firestone's 282 Notice.

139. Part II of the Summary Report referred to in Finding 141 states, at page 692:

> "Except for a few special purposes raw Buna as received from the polymerization plants cannot be processed prior to a partial depolymerization or 'heat-softening' operation. Even after this heat softening, larger percentages of softeners are necessary in German compounds than is customary in American practice."

The article then gives a number of tread recipes. The "Continental A" tread stock recipe (Continental Gummi Werke, Hanover, Germany) on page 693 is the only one relied upon by Firestone. The Continental A recipe comprises 40 parts of Buna S-3 rubber of 700 defo, 17.3 parts of 300 defo, 3.5 parts of Buna SS of 700 defo and 39.2 parts of Buna S-3 Crumbs. It is conceded that the Buna rubbers of 300 and 700 defo were heat softened. No Mooney or other toughness value is ascribed to the "crumbs." There is merely a footnote reference to its being "Raw Buna S-3 which has not been sheeted." No other reference to this product is contained in the article.

PX1221, tab B

140. The Court finds that in Germany rubber latex was made into a rubber sheet by coagulating it in the form of a fine crumb slurry and putting the slurry on a moving screen-like belt (as used in paper-making) through which the water drained, leaving a layer of rubber particles that was calendered into a sheet. This sheet was then dried by passing it through a drying oven. The only "crumb" product in this process was the scrap material which did not form a sheet, or which fell through or off the wire, and was swept up from the floor. This scrap material, sold in paper bags, had no specification as to defo or any other property. While there is no evidence that such "crumb" was neces-

sarily the "crumb" in the article, there has been no showing that any other German material met the description in the recipe. Therefore, no toughness value can be read into or inferred from the "crumb" of the recipe contained in Part II of the Summary Report.

GX2522, p. 949 — Hormuth, B.31,879-89; 31,998-99

141. The Continental A recipe contained in Part II of the Summary Report referred to in Findings 141-43 shows the presence of 19.6 parts of Naftolen. The mixing procedure in column 1 of page 693 says that the Buna S crumbs and Naftolen were premixed separately in a 2 to 1 ratio in a Banbury. No description is given as to the temperature or time in the Banbury or what happened to the product after it was mixed. Mr. Thiele, who was in charge of forming mixtures of Buna and Naftolen at Continental at this time, testified that his normal procedure was to mix for 25 to 35 minutes without cooling water. Dr. Semon said that when he mixed an oil-rubber batch for 20 minutes in a Banbury, and with cooling water, there was a 40 point drop in Mooney which he ascribed to degradation of the polymer. Moreover, it was known that the Germans added materials in manufacturing Buna S that accelerated its heat degradation. While such long, hot, and degrading mixing was not specifically referred to in Part II of the Summary Report, there is no evidence that any other type of Banbury mixing procedure was used in Germany. Therefore, an absence of this degrading premix cannot be read into or inferred from the reference.

GX2522, p. 948 — Thiele, B32,719-35; 32,941-52
FX2533 — Semon, C546-51
FX2514
GX2683, tabs 136A, 138, Exhibit C, pp. 2685-92

142. The mixing procedures given in Part II of the Summary Report referred to in Findings 141-44 (exclusive of the Buna-Naftolen premix) show: (1) that the speed of the Banbury had to be reduced by approximately one-third to avoid overheating, and (2) that the mill speeds were reduced approximately 25% for the same reason. While one cannot be sure from the reference just how long the total mixing time was, the specific times given add up to 47 minutes without counting the Banbury mixing and milling of the Buna-Naftolen batch. The German mixing and milling procedure therefore took at least three times as long as conventional American times, and perhaps six (or more) times as long. The practical significance of this fact is that in order for a German factory to process the same amount of rubber as an American factory in a given time it would have to utilize several times the number of Banbury mixers and mills employed by the American factory. In summary, while the Summary Report fails to show the Mooney or defo of the rubber, it does teach that all of the rubber was severely degraded; and that despite this degradation and the addition of oil it was impossible to process the tread stock in anywhere near the conventional manner or times. Furthermore, while this art was available in this country as early as 1945, there is no evidence that anyone followed it. The Court finds that the Summary Report does not anticipate or teach the invention of the patent in suit.

PX1221, tab B
Findings, 49-50

143. Firestone also relies upon a portion of a microfilm reel of captured German documents ("D") containing a report on "Rubber-Saving Tires" prepared by the Austrian rubber company, Semperit.[35] This report describes

35) Contained in item 29 in Firestone's 282 Notice.

a tread compound containing admittedly heat softened Buna and a 2:1 Buna S-Naftolen mixture without reference to the toughness of the Buna S except that it is said to be, as a starting ingredient, "not degraded." The report says that the simplest way of adding softener is to pre-mix the Buna and softener in heated internal mixer (Banbury). No further instructions are given in the report. However, another copy of the same report in the same microfilm did have the related mixing instructions attached. These instructions show that the mixture of Buna S and Naftolen was made by mixing for 30 minutes in a Banbury, followed by a milling of the mixture. In other words, the Buna S-Naftolen pre-mix of Semperit was essentially the same as that used by Continental (Finding 141). Firestone may not rely upon that portion of the microfilm it considers favorable and ignore the damaging portion. Both must be read together. The Court finds that even if a publication this Semperit report does not anticipate or teach the invention of the patent in suit.

FX2848A
GX2686A, p. 117291

144. Firestone relies upon another microfilm report ("D") entitled "Naftolen-Buna-Plastizierung 'Sparbuna'" (February 1944)[36] which is apparently a brochure of a German company attempting to sell Naftolen. In summary, this brochure states:

> "The most effective savings of Buna is achieved by combining large additions of plasticiser with gentle mechanical or thermal degradation, in the presence of the plasticiser."

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36) Item 54 in Firestone's 282 Notice.

Even if a publication, this article does not anticipate or teach the invention of the patent in suit.

PX1930 (FX2826)

145. Firestone relies upon a microfilm ("D") of an abandoned application S143,078.[37] This is no more than a vague disclosure of adding 20 to 100% of "lanolin, mineral oil or Naftolen" to Buna S for no stated end purpose other than to make hot water bottles. Even if a publication, it does not anticipate or teach the invention of the patent in suit.

PX1725 (FX2828) FX2829

146. Firestone relies upon a microfilm ("D") of an abandoned application 155,625.[38] This shows the same "economy" tread compound as is described in the Semperit "Rubber-Saving Tires" report[39] (See Finding 143). The method of mixing the Buna S and Naftolen is said to be in a "suitably heated internal mixer." Even if a publication, it does not anticipate or teach the invention of the patent in suit.

PX1728 (FX2831)
FX2848A
GX2686A, p. 117291

147. Firestone relies upon a microfilm ("D") of an abandoned Semperit Austrian patent application S157,457.[40] This application sets out the example (as given in the Semperit report[41] discussed in Finding 143 of how much rubber is saved in using an "economy" tread com-

37) Item 55 in Firestone's 282 notice.
38) Item 56 in Firestone's 282 notice.
39) Item 29 in Firestone's 282 notice.
40) Item 56 in Firestone's 282 notice.
41) Item 28 in Firestone's 282 notice.

pound, but does not give the recipe for such compound. No directions are given for mixing other than it be done on a mill or in an internal mixer, "elevated temperatures being necessary only as required by the viscosity of the softener." Even if a publication, it does not anticipate or teach the invention of the patent in suit.

PX1729 (FX2834)
FX2848A
GX2686A, p. 117291

148. The Court has considered the various other German references relied upon by Firestone. Even if publications, none anticipates or teaches the invention of the patent in suit.

The Government Art.

149. Firestone has cited several references relating to work done in connection with the government sponsored synthetic rubber program. One of these is a June, 1947 paper ("D") entitled "Summary of Government Tire Testing" by L. A. Woerner of the government entity, Rubber Reserve. This paper[42] presents the problem solved by the patentees, i.e., how could the inherently superior properties of high Mooney rubber be utilized in tire treads. It did not present the solution. In a covering letter to the report, Mr. Woerner said:

> "The writer has an honest and sincere conviction that these suggestions stand an excellent chance of eventually resulting in a superior wearing tire, and that processing methods although possibly unorthodox to the rubber industry, can be worked out to allow for the economic handling of these polymers."

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42) Item 39 in Firestone's 282 notice.

It is further apparent that Woerner was not suggesting use of large amounts of oil from his statement that it was:

> ". . . [Q]uite evident that high Mooney polymers have value if methods of processing can be found which will allow processing without the utilization of plasticization which reduces the tread wear of such polymers to values approaching GR-S."

Even if a publication, this reference does not anticipate or teach the invention of the patent in suit, but rather leads away from it.

PX1900

150. Firestone relies upon the Final Report ("D") of an experimental project, Tire Test 123,[43] carried out on the government tire test fleet and circulated to certain participants in the government synthetic rubber program. Even if a publication, this reference does not anticipate and on its face led away from the invention. The amount of carbon black used is not disclosed. Furthermore, the conclusion of the report is that:

> "The outstanding experimental polymer from the standpoint of treadwear was the Cumene-hydroperoxide 50 Mooney, rated 21% superior to control GR-S-10 in this respect."

It is also apparent from the Final Report of Tire Test 123 that the high Mooney tread compounds were not prepared in the ordinary way or in the ordinary times used for the tread compounds made from the regular Mooney rubber. They were given an extra Banbury mixing, which added 25% to the mixing times used for the regular Mooney

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43) Item 47 in Firestone's 282 notice.

compounds, not counting the considerable additional recycling delays.

PX1114A

151. Firestone has cited several other tire test reports which the Court has considered, but these reports carry the case no further for Firestone than does Tire Test 123. None is an anticipation of, nor teaches the invention of, the patent in suit.

The McMillan Art.

152. The McMillan work is representative of work in this country by major oil companies such as Shell (McMillan's employer) and Phillips, seeking ways to increase their oil sales to the rubber industry. The theory underlying McMillan's work was that the excessive softening resulting from the addition of increased amounts of oil to ordinary Mooney rubber (50-60 ML-4) could be compensated for by the addition of excessive amounts of carbon black (which has a stiffening effect). The McMillan work is reported in articles in the July and August, 1947 issues of Rubber Age (dealing with additions of oil and carbon black to hot GR-S rubber) and the March, 1950 issue of Rubber Age (dealing with oil and carbon black additions to cold GR-S rubber). Firestone concedes that McMillan used only 50-60 Mooney rubber but argues that the work made the invention obvious. Apparently it was not obvious to the tire industry, however, since McMillan's theory was not accepted by the tire makers; neither did it lead the industry or Shell to extend the theory to high Mooney rubber. The known adverse effect of the increased black (in ordinary Mooney rubber) on the hysteresis properties of the stock discouraged work along

this line. This abandoned theory does not point the way to success; it points away from it.

PX1116	Baker, B4554-66
PX1054	B19,066-67
GX2682, tab 889-890	PX1036

The Goodrich Art.

153. Firestone has cited certain articles pertaining to work reported by Goodrich, one of which is CD 380 entitled "Pilot Plant Development of Laurylamine GR-S."[44] ("D") This report shows that high Mooney rubber possesses certain superior properties. However, the report concluded that:

> "These polymers are extremely tough and would be difficult to process. Hot air softening [heat degradation] improves the processing characteristics but greatly reduces the flex cracking resistance. . . . It may be possible to develop high black-high softener stocks which are processable."

The basic teaching was that high Mooney rubber showed promise if a way could be found to process it. Oil extension was not recommended by Goodrich. This reference, even if a publication, does not anticipate or teach the invention of the patent in suit.

PX1564
FX2815

154. Firestone also argues that an article by Dr. Yanko of Goodrich entitled "Physical Properties of Fractions of GR-S and Their Vulcanizates," *Journal of Polymer Science*, 1948,[45] points the way to the invention and that

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44) Prior art item 24 in Firestone's 282 notice.

45) Prior art item 64 in Firestone's 282 notice.

it discloses the principle of the invention. Yanko's theoretical work does not anticipate the invention. His work merely showed that regular GR-S of 50 Mooney was made up of some high molecular weight fractions and some law fractions, with a distribution of fractions intermediate. No tire tread or any other compounds are shown or discussed. Firestone now says that if the low fraction is removed, leaving a higher fraction, and replaced with oil, one obtains General's invention. This argument is both hindsight and unsound. Yanko never suggested that this could be done, nor is there any evidence that it could be done. This reference does not anticipate or teach the invention of the patent in suit.

PX1017

155. The Court has considered numerous other references dealing with cold rubber, butyl rubbers, nitrile rubbers, neoprene rubbers, adhesives, mechanical goods, general teachings that high Mooney rubber had superior treadwear properties, and general teachings that oil acts as a softener for rubber. These references do not anticipate or teach the invention of the patent in suit. They were cited to show the state of the art and for the most part do not relate to matters in controversy. They need not be discussed individually.

ALLEGED PRIOR USES.

A. By Wilmington Chemical Corporation.

156. Firestone contends that certain experimental activities carried out in 1942 and 1943 by and in cooperation with the Wilmington Chemical Corporation, then abandoned, amounted to a prior public use of the invention claimed by General. This work, like the Rostler prior art articles discussed *supra*, was based on Rostler's theory of

Naftolen co-vulcanization. In fact, the alleged prior art article discussed in Finding 136 purports to be a report of the work here alleged as a prior use. That report has been found to fail as an anticipation. The alleged work itself fares no better for the reasons set out in the following findings.

157. The rubber involved in the Wilmington Chemical Company's alleged use was made in two batches (about two months apart) by the Dewey & Almy Chemical Company at the request of Wilmington Chemical. Rostler and Dr. Mark, then assistant director of research at Dewey and Almy, testified that in oral discussions prior to making the rubber, the Wilmington Chemical people asked for a tough[46] rubber, but there was nothing in contemporaneous documents, including purchase orders and correspondence, to corroborate that testimony. No Mooney measurements were made at any stage of the production of the Dewey and Almy rubber. The vague and uncorroborated oral testimony of Dr. Mark, regarding the Mooney viscosity of other rubbers made much later from "similar" recipes cannot be accepted as clear and convincing evidence of the viscosity of the rubber batches in question. Contrary to usual practice, no preliminary batches were run by Dewey & Almy to determine and preduct the toughness of the polymer that would be obtained from a given recipe and raw materials. Dewey & Almy did not have prior experience with the type recipe or conversion used for the Wilmington batches. Their usual recipes called for almost 100% conversion, producing a polymer suitable for gaskets, but not suitable for tires or treads. Rostler testified that Williams plasticity measurements were made, but not where, when, or by whom. No records of such measurements, contemporaneous or otherwise, have been

46) In 1943-43 a polymer having a Mooney of 60-65 was considered "tough."

offered by Firestone. The recipe said to be used to make the two batches of latex at Dewey & Almy is in evidence. It is substantially the same as the recipe then being used in the government plants for 50±5ML-4 standard GR-S. The amount of modifier[47] used was the same as for GR-S. The degree of conversion was increased from 72 to 75%, but all other things being equal, this increase would not increase the Mooney viscosity by more than about 5 ML-4 units. The Court finds that the Mooney of the rubber made by Dewey & Almy has not been established and there is no showing that it had, or was intended to have, a Mooney in the vicinity of 90 ML-4.

GX2522, pp. 187, 246
FX2716
PX1053, p. 665
Rostler, C3170-74; 3218-19
Mark, C3360-65; 3371-73; 3387-92
Osberg, B37,970-71
Cooper, B19,225-29
Baker, B5746-50; 6160-61; 6639-40
Soday, C3484-93

158. An emulsion of Naftolen was added to the latices prepared by Dewey & Almy and the mixtures were coagulated. No one testified that he had checked himself, or had someone else check the amount of Naftolen in the emulsion, the amount of the emulsion added to the rubber latex, or the amount of Naftolen that was actually retained by the rubber. There were no contemporaneous records offered to show that anyone actually mixed the two materials in any particular ratios. The Court finds that the amount of Naftolen contained in the rubber-Naftolen batches made by Dewey & Almy has not been established.

Rostler, C3180-81; 3301-02
Osberg, B38,251-52

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47) The toughness of a polymer is controlled by the amount of modifier used. See Finding 26.

159. The rubber-Naftolen batches obtained from Dewey & Almy were sent by Wilmington Chemical to various companies for evaluation in mechanical goods compounds, such as heels, and one batch (purportedly containing 20 parts Naftolen) was sent to Lee Tire & Rubber Company for evaluation in a tread compound. There is no evidence that such a tread was ever made, however. There was no admissible evidence that compounds of any type were ever mixed and cured by anyone, even on a laboratory scale. Dr. Arthur Nellen, chief chemist (compounder) at Lee Tire in 1942 and 1943, had agreed to testify as an expert on behalf of Firestone in Baltimore. However, he was not called or deposed by Firestone.

Rostler, C3195-96
Osberg, B38,002-03; 38,006; 38,292-96

160. Dr. Rostler and others at Wilmington Chemical testified before Judge Holtzoff in support of the same prior use alleged here; many of the same documents were relied upon there and here. Judge Holtzoff found that a prior use had not been established; Firestone has not offered any better evidence here. The Court finds that the activities of Wilmington Chemical Company do not constitute a prior knowledge, invention, or use of the invention of the patent in suit. They were at most unsuccessful, incomplete, and abandoned experiments.

DX1393
184 F.Supp. 344, 349

B. By Phillips, Lake Shore, and the Government Tire Test Fleet (Tire Test 123)

161. Firestone contends that certain experimental activities carried out in 1947 by the Phillips Petroleum

Corporation together with the Lake Shore Tire & Rubber Company and the Government test fleet amounted to a prior public use and sale of the invention claimed by General. The final report of Government Tire Test 123 purports to be a report of this alleged prior use. That report, even if a publication, has been found to fail as an anticipation (See Finding 150). The alleged work itself fares no better.

162. The work involved in the Tire Test 123 alleged prior use was experimental, abandoned, and not shown to have been available to the public. The rubbers were made in the Phillips pilot plant at Borger, Texas, as experimental polymers. The compounds were mixed and the tires built in the Lake Shore tire plant at Des Moines, Iowa, experimentally, for testing on the government experimental test fleet at San Antonio, Texas. The tires were said to be "sold" to the government testing fleet, but this was the understanding, pursuant to standard practice of the testing fleet, that the tires would be permanently returned to Lake Shore after the testing, and the tires were so returned. This arrangement did not constitute a commercial sale in fact, nor were the tires "on sale" within the meaning of 35 USC §102. The transaction was at most a service charge for the experimental production of the tires.

PX1114A	Sperberg, C3561-65; 3610-12
Troyan, C2205-06	
Tucker, FX2720, pp. 18-20	Reynolds, C3721; 3757
Rude, C1390-91; 1393-94;	Blackeney, C4540-42; 1584-86

163. According to the government final report on Tire Test 123, several groups of tires were made, each tire within a group having the same tread compound and

each group being prepared from a rubber which was stated to be of a particular Mooney value (ranging from 45 to 125 ML-4). The fact, however, is that the tread compounds were not shown to have been made from a rubber of a particular Mooney value. The Mooney of the rubber intended to be used in each tread compound was worked out on paper at the Phillips pilot plant at Borger, Texas by combining pilot plant runs of varying Mooney to give the intended average Mooney. There is no evidence, however, that the individual runs of rubbers were in fact combined by Phillips in any way prior to shipment from Borger. Since all of the rubber was formed into 20 pound bales at Borger, the only way the rubbers of the different runs could have been blended would have been by apportioning bales from the different runs in the appropriate ratios. There is no evidence that this was done at Borger or at Des Moines. When the rubber arrived at the Des Moines, Iowa, Lake Shore tire factory, no Mooney measurements of the rubber were made, and the evidence is that the 20 pound bales needed to make up a Banbury batch of some 400 pounds were selected without regard to their individual Mooney value. There was, in short, no testimony or records showing how much or what proportion of each batch of rubber was used in any particular compound. There is no clear and convincing evidence of the Mooney viscosity of the rubber actually used (as opposed to what was intended) in any tread compound in the test.

PX1822	Troyan, C2232-37
FX2669	Tucker, FX2720, pp. 21-27;
Rude, C1505-16; 1556-59	34-36
	Sperberg, C3593-94; 3616

164. Tire Test 123, in essence, compared experimental tires having treads made from the then recently-developed cold rubber with tires having treads made from

the then conventional hot rubbers. The control tread was made from a 50 Mooney hot rubber and 5 parts of oil. One group of experimental treads were made from 50 Mooney cold rubber and 2 parts of oil; the other from purportedly higher than normal Mooney cold rubber (up to 125 ML-4) and variable amounts of oil (up to 20 parts). The experimental tread compounds of Tire Test 123 were mixed in standard factory equipment at Lake Shore, but in every case where the tread compound purportedly contained a rubber of higher than normal Mooney it was not mixed in the usual way or in the usual working times. Each of these allegedly high Mooney compounds was subjected to an added "Remill" step of 2½ or 2¾ minutes in a Banbury before its "Final Mix," thereby increasing the Banbury working time by nearly 25% over the compounds containing the normal Mooney rubber.

FX2723 Sperberg, C3563-65; 3677;
FX2724 3591-96

165. The conclusion drawn from Tire Test 123, as stated in the final report prepared by Rubber Reserve test fleet and approved by Mr. Greer, the head of research and development for the government and one who had followed the test closely, was that:

"The outstanding experimental polymer from the standpoint of treadwear was the Cumene-hydroperoxide 50 Mooney rated 21% superior to control GR-S-10 in this respect."

PX1114A Blakeney, C4542
Greer, C844

166. The Court finds that the experimental work allegedly involving higher-than-normal viscosity rubbers in Tire Test 123 was abandoned and taught away from, not toward, the invention:

(a) In accordance with the conclusion of the final report on Tire Test 123, 50 Mooney cold rubber went into large scale commercial production thereafter and eventually became the standard rubber for tire treads. In contrast, cold rubber having a Mooney above 65 Mooney was not commercially produced or used for tire treads until after General's invention.

(b) The results of the test itself discouraged further work with high Mooney rubber. It emphasized the 50 Mooney rubber as the outstanding polymer, and it showed that the high Mooney rubbers could not be processed in the ordinary time or manner.

(c) Unfavorable comments on the high Mooney-high oil aspect of the tests were reported by personnel at Phillips.

(d) Unfavorable comments on the high Mooney-high oil compounds were also expressed by Lake Shore personnel. In March, 1951 after General's invention had been announced, an inquiry about the Tire Test 123 work was made of Mr. Roy E. Rude, technical manager at Lake Shore when the tests were made and a major participant in them. He wrote that he was a "low Mooney advocate" and that as a result of Tire Test 123 work, Lake Shore would "not recommend the use or incorporation of over 12 parts of softener." Further, regarding Tire Test 123, he said:

> "We discontinued our experimentation on high Mooney GR-S with high oil to work on cold rubber. The better polymers on cold rubber have shown to be ones with low Mooney but no advantage was seen in the very high Mooney polymers, in particular with the high oil." (GX2575)

(e) Mr. Greer, in trying to determine what General's invention was, considered the high Mooney-high oil work reported in Tire Test 123, but he concluded General's most likely course was with low Mooney rubber and high amounts of carbon black.

GX2682, tab 889-890	GX2622
GX2516, par. 18	GX2575
PX1114A	PX1744, tab C

C. By Oliver Tire & Rubber Company

167. Firestone contends that the activities of the Oliver Tire Rubber Company in 1949 constitute a prior use and sale of the invention of the patent in suit. The records of this company reflect that in 1949 and 1950, it made camelback containing 18 to 26 parts of oil as a commercial product. The chief chemist of Oliver, Mr. Kettering, testified that he at times orally requested that his supplier of 50 Mooney GR-S furnish him with rubber on the high Mooney side of its specification. There were no records offered to establish that Mr. Kettering got what he requested nor that the specifications involved permitted a viscosity about 55 ML-4 which was the upper limit in GR-S specifications at that time. Consequently, the Court finds that the GR-S rubber employed by Oliver in the alleged prior use had a viscosity not substantially above 50 Mooney. It was not an anticipation of and did not teach the invention of the patent in suit.

GX2516, par. 14	Kettering, C2320-22

UNOBVIOUSNESS

168. Firestone has contended that the invention would have been obvious to a person skilled in the art under 35 USC 103, even if (as the Court has found) it was not

anticipated by the prior art under 35 USC 102. In connection with this defense, the Court has given consideration to the determination of who was the hypothetical person having "ordinary" skill in the "art," and what "art" is relevant. It has also given consideration to the subject matter of the invention as a whole and the entirety of the prior art cited by Firestone, all as required by 35 USC 103.

169. The man of ordinary skill in the art, to whose mind the question of obviousness is directed, is the tire tread development compounder. (See Finding 46.) Dr. Rostler was not such a man, nor was McMillan, Greer, or Yanko. Nevertheless, as shown by their contemporaneous actions, the invention was not obvious to them. Dr. Semon, Firestone's expert witness, was by no means an ordinary man skilled in the art. His history in the field of rubber chemistry is far above the ordinary. He is the holder of over 100 U. S. patents and was a pioneering inventor in rubber chemistry. At the time of General's invention, he was head of Pioneering Research for Goodrich; yet, the invention was not obvious to him.

Semon, C498; 3889; 4288-91

170. The reactions to General's invention by those possessing the relevant skill in the art are set out in Findings 80-88. Vogt of Goodyear was such a man; he ridiculed the idea of using as much oil in tire treads. Baker of Central was such a man; he was initially a bottleneck to the development of the invention. Torrence of Firestone was such a man; he was surprised that General would advocate the use of so much oil in tire treads. Taylor of Firestone U.K. was such a man; he was surprised and astonished at General's announced invention. In short, the initial reaction of these skilled persons (as well as the executive of U. S. Rubber, who felt compelled to write the president of General that good bourbon should not be

cut with water) was disbelief and skepticism. Even General's own inventors were at first afraid that what they were doing would hurt their reputations in the art.

171. This initial skepticism and disbelief was quickly replaced by adoption of the invention, however, as set out in the Findings 84-88. Firestone's own Synthetic Rubber Facts book, published after the invention but before the patent issued, acknowledged that it had been known for some time that high Mooney rubber had superior tread-wear resistance, but that this property could not be exploited because of processing difficulties. It also acknowledged that oil extension solved the problem and resulted in a lower cost, satisfactorily processible tire tread with improved tread wear and crack resistance and improved hysteresis characteristics. In both its Facts Book and its own patent, Firestone also acknowledged (after the invention) that the wear ratings of oil extended tire treads were much higher than would have been predicted from a consideration of the diluting effect of the oil on the rubber.

172. Also relevant to the issue of obviousness is the work of Goodyear and the government in 1951. On November 7, 1950, General's president, W. O'Neil, made the fact of the invention public with an offer of sale to the government and an announcement to the industry of a General development that could make 22% more synthetic rubber available with the then scarce materials and the same equipment as was then being used. He also announced that General had run tire tests showing that treads made according to the invention were better than treads made with GR-S. O'Neil did not disclose further what the invention was, however.

173. O'Neil's announcement (referred to in Finding 175) precipitated an immediate effort on the part of Rubber Reserve and others in the industry, most notably Goodyear, to determine what General's invention was. By November 11, 1950, Goodyear had begun work to ascertain what the invention could be. In November and December, 1950, Goodyear's approach was to try to extend synthetic rubber with reclaimed (scrap) rubber and with lignin (a filler).

DX1585 Riddle, B17,647-64

174. Then, on January 8, 1951, Mr. Rowzee, a former Goodyear employee who was then manager of Polymer Corporation (General's supplier of high Mooney rubber), visited Goodyear in Akron. Rowzee testified that he discussed the subject of General's work with Dr. Dinsmore, Goodyear's vice president of research and development, and in response to Dinsmore's questions, informed him that it was true that Polymer Corporation was working with General and that the development was one of substance.

Rowzee, B30,332-34

175. On January 17, 1951, Goodyear began to work on latex mixing of high Mooney rubber with 20-40 parts of plasticizer. A Goodyear research memorandum of that date setting up the large scale project states that:

> "The present program was initiated as a result of conversations between Messrs. Osterhof, Clifford, Patterson and D'Ianni, in which were discussed the possible courses General Tire might be following in their alleged production of 'more rubber of high quality without using more monomers.' Information from Canadian Synthetic[48] officials, while lacking in

48) "Canadian Synthetic" referred to in the January 17 Goodyear memo was jointly owned by several American rubber companies, including Goodyear, Firestone, Goodrich, and U. S. Rubber. By agreement with Polymer Corporation, Canadian Synthetic operated Polymer's synthetic rubber plant at Sarnia.

specific details, had indicated that Sarnia was producing the product for General, that the process involved no important new technological innovations, that the materials used were widely available and cheap, and that the product was approximately the quality equivalent of present cold rubber stocks. The current approach was conjectured as one they might likely be taking, and also one on which we have no information of our own."

DX1580	Riddle, B17,665-69
DX1586	Pierson, B17,623-30
DX1587	Rowzee, B30,348-49
GX2683, tab 91	

176. After January 17, 1951, Goodyear discontinued its efforts to extend rubber with reclaim and lignin and concentrated on high Mooney oil extension. On February 19, 1951, Goodyear's Chairman of the Board issued a press release announcing the results of this work and stating that:

"Research Laboratories of the Goodyear Tire & Rubber Company made an important contribution to the Government rubber program which may have far-reaching effects on future plans for the country's rubber supply. . . ."

The release went on to say that this development was being given to the government "free of charge" and that it could "save the government considerable expenditure in making plans for further production of synthetic rubber."

DX1586	DX1611
DX1587	

177. O'Neil's announcement of November 7, 1950 (referred to in Finding 175), also caused an immediate search

on the part of the government to determine what the invention was. Mr. Greer, Manager of Research and Development for Rubber Reserve, was in overall charge of this effort from the technical aspect. In a series of memoranda between January 5 and February 9, 1951, Greer estimated that General's invention might include the addition of reclaim or lignin (as Goodyear had first thought). He also thought it might involve vulcanizable softeners, the use of low Mooney rubber plus increased carbon black and oil, the use of high Mooney rubber plus oil, the use of tar, asphalts, or natural resins, or adding new materials to the polymerization reactor. In a meeting of the Rubber Reserve staff, including Greer, on January 16, 1951, the suggestions included the use of: high amounts of carbon blacks, lignin, reclaim, vulcanizable oils, saturated oils, low Mooney rubber plus oil and carbon black, high Mooney rubber plus oil, thermoplastic and thermosetting resins, natural resins, thiokol, special rubbers, asphalts, and tars.

PX1744, C,E-I
DX1727

Greer, C675; 1242-44

178. Among Greer's many suggestions, the use of high Mooney rubber plus oil appears in his memorandum dated January 5, 1951. Firestone looks to this as evidence of obviousness. The reverse is true. Not only is this suggestion for high Mooney rubber plus oil unemphasized, but Greer's memorandum of January 5, 1951 (which lists this among four other suggestions) goes on to pick low Mooney rubber plus extra carbon black and oil as the "most probable" basis of General's invention. On January 25, 1951, Greer instructed the government laboratories to begin work adding oil to regular GR-S in the reactor. On February 7, 1951, he instructed those labs to work on the extension of regular GR-S with resins. Neither of these projects

was successful and neither was in the direction of General's invention. No work on high Mooney-high oil compounds could be pointed to by Greer as having been done at the government laboratories in January, 1951.

PX1744 C, G, H Greer, C1264-67

179. On February 6, 1951, Mr. Spencer, a member of another government agency, prepared a memo reporting a telephone conversation he had had that day with Mr. Rowzee of Polymer Corporation. A copy of this memorandum contains the handwriting of Mr. Oberfell, head of production for Rubber Reserve, and was found in his personal files after his death. This memo shows that Rowzee had informed Spencer that Polymer Corporation had been making monthly runs of 50 to 100 thousand pounds of product for General; that General's product was equal to GR-S; that General's claim to conserving 22% of the butadiene and styrene materials was conservative, the amount ranging well in excess of 25%; that no extra equipment was needed except for additional drying and coagulation equipment; and that the Polymer Corporation people were sufficiently sold on General's development that they were installing the added equipment in order to obtain the 25% increase in capacity made possible by the development. In addition, Rowzee gave an example showing that between 125 and 150 pounds of rubber equivalent to GR-S could be obtained from 90 to 95 pounds of butadiene-styrene raw material and, according to Spencer, Rowzee indicated his willingness to consult with any members of the government in connection with General's development.

GX2560 Koontz, C5508-09

180. On February 19, 1951, Goodyear made the announcement of its important discovery and was promptly

given authority to begin production of high Mooney-high oil masterbatches. On February 20, 1951, Greer, answering Oberfell's memo of February 1, 1951, which asked what was the most promising development in connection with the government work, stated that:

> "I am sure you will agree that there is only one answer at present: The use of softening oils as extenders to expand the apparent production of GR-S, which is currently being worked at the Government Laboratories and Goodyear."

DX1611
GX2557

181. The "only one answer" referred to in the preceding Finding is in contrast to Greer's plurality of answers before the date of the Spencer memo and the fact that before November 7, 1950, there is no evidence that the government was thinking of high Mooney oil extended rubber, even as a hypothetical possibility. Although the Korean War (beginning in June, 1950) had created a need for expansion of synthetic rubber production, the RFC Consolidated Research Budget for 1950-51 (dated August 31, 1950) contained no provision for research work on high Mooney oil extended rubber. Greer worked on the preparation of that budget and did not recall making any requests for research that did not appear in the budget. Neither did Greer make any such recommendation in a memo of November 1, 1950 (six days before O'Neil's announcement[49]) in response to an official request for suggestions on how to increase the rubber supply. In his November 1 memo, Greer commented on various ways of increasing GR-S production, including lower conversion, high temperature, continuous polymerization, more

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49) Finding 175.

reactors, etc., but did not suggest oil extension as an answer to the problem of expansion of production.

GX2557	Greer, C1218-24
GX2555	DX1901

182. The work of the government and Goodyear in attempting to discover what General's invention was constitutes additional evidence of unobviousness. Their initial work tended away from, not toward, the invention. Their later work, coming as an about face and only after receipt of information from Canada, is not evidence of obviousness.

183. The invention has enjoyed enormous commercial success, as set out in Finding 84. Further, every significant tire producer in this country (other than Firestone) has taken a license under the patent, either directly or by way of settlement of litigation. The subtests of long-felt need, prior attempts and failures, initial disbelief, surprising results, inability to duplicate, as well as commercial success are all present in this case and support the invention.

184. The main test of obviousness likewise supports the invention. The Court has considered all of the prior art references cited by Firestone and the extent to which they were accepted or rejected by the art, not just the mosaic of language selected from the various pieces of prior art and assembled in a manner said to point to the invention. The Court has considered the language pointing away from the invention (often in the same reference, e.g., PX1221, tabs A & B) as well as that relied upon as allegedly pointing toward the invention. In addition, the Court has considered the deep-seated prejudice among those skilled in the art against the use of large quantities of oil in quality products such as tire treads. Having all these factors in mind, the Court finds that the subject matter of the invention as a whole would not have been obvious at the time of the invention to a person having ordinary skill in the art to which it pertains.

LICENSE

185. Firestone contends that even if the patent is found to be valid and infringed, there is no liability because it should have a royalty-free license under the patent. It is contended that the government was entitled to such a license because the invention falls within the license-granting provisions of a Research Contract between General and the government and that this alleged government license was later given to Firestone in connection with Firestone's purchase of the government-owned synthetic rubber plant at Lake Charles, Louisiana, to apply to the sale of rubber products then being made at that plant.

PX1241 "Research Contract" tab 1, par. 7
PX1241 "Nomination Contract"

186. General's Research Contract is an implementation of and specifically refers to another agreement between General and the government, executed February 2, 1943, for the operation of the government-owned synthetic rubber plant at Baytown, Texas. That agreement (known as the Operating Agreement) refers in turn to an Exchange Agreement, one of several wartime agreements to which the government and others, including Firestone, were parties. In order to place General's contracts with the government in relation to the overall government synthetic rubber program of which they were a part, it is necessary to trace the development of that program and the legislation which affected it.

PX1241 "Research Contract" tabs 1-8
PX1241 "Operating Contract" tabs 1-3
DX1404

187. In June, 1940 the government organized Rubber Reserve Company, a subsidiary of Reconstruction Finance

Corporation, for the purpose of stockpiling natural rubber. When it became apparent that stockpiling was not the complete answer to the emergency rubber situation created by hostilities then existing in Asia, the government began to formulate a program for the construction, operation, control, and supervision of synthetic rubber plants and to determine the type of synthetic rubber to make, its specifications, and its raw material requirements. Primary responsibility for this government function was allocated to Rubber Reserve. As a result of various reorganizations, Rubber Reserve Company was succeeded by the RFC Office of Rubber Reserve, later known as the Office of Synthetic Rubber. These various governmental entities will be referred to generally as Rubber Reserve, Reserve, or simply the government.

15 U.S.C. 606(b)
1948 U.S. Code Cong. Serv. p. 1342
Ex. Order No. 9942, April 1, 1948

188. Beginning in 1941, Rubber Reserve entered into a series of pooling agreements designed to provide the technical information, know-how, and patent rights for the commercial production and compounding of synthetic rubber. The basic pooling agreements were known as the Exchange Agreement, the Compounding Agreement, and the Cross-License Agreement.

DX1404
DX1430
DX1738
DX1413B
DX1413E

189. The Exchange Agreement[50] entered into December 19, 1941, provided for an exchange of technical infor-

50) This agreement was captioned "Agreement on Exchange and Use of Technical Information."

mation among the parties and for cross-licenses under their patents which covered synthetic rubber, its method and equipment of manufacture, and its utilization in the manufacture of fabricated articles. The parties to this Agreement were Rubber Reserve, the Big Four (Goodyear, Firestone, U. S. Rubber, and Goodrich), who were to operate the first-built government synthetic rubber plants, and Standard Oil, which had exclusive U. S. rights to certain German basic patents relating to synthetic rubber. General was not a party to the Exchange Agreement.

DX1404

190. The Compounding Agreements[51] entered into between the Big Four and Rubber Reserve on July 3, 1942, extended the exchange of technical information and royalty-free cross-licenses to the compounding of synthetic rubber in addition to its manufacture. Compounding was defined in the agreement as any process for converting synthetic rubber into tires and tubes, or into compounds suitable for tires, including the incorporation therein of compounding agents such as softeners, fillers, and vulcanizers. General was not a party to the Compounding Agreement.

DX1430, p. 2

191. The Cross-License Agreement, like the Compounding Agreement, was broader than the Exchange Agreement in that it provided for the exchange of technical information and royalty-free licenses directed not only to synthetic rubber, but also its compounding and vulcanization and to compounds and vulcanizates [end products] thus obtained. It was an open pool permitting companies

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51) The full name of the agreement was "Agreement on Exchange of Technical Information and Patent Rights Relating to the Compounding of Synthetic Rubber."

later choosing to sign it to participate in the exchange of technical information and licenses. It was signed first by signatories to the Exchange Agreement, including Firestone, beginning in September, 1943 and was eventually executed by some 38 companies involved in the rubber program, but not General.

DX1738, pp. 5-7
DX1413B
DX1413E

192. In addition to the basic pooling agreements (the Exchange Agreement, the Cross-License Agreement, and the Compounding Agreement), the government obtained other technical information and rights by way of private license agreements with individual companies. For example, Rubber Reserve executed licenses with Firestone, Goodyear, and U. S. Rubber which called for the government's payment of 3/8 of a cent per pound for various chemicals (such as antioxidants) manufactured under their patents and used in the production of synthetic rubber.

DX 1737, tabs A-C

193. The actual production of synthetic rubber in the plants built and owned by the government was accomplished under agreements known as Operating Agreements entered into by the Big Four, General and others, early in the program. These agreements provided that the companies would operate the synthetic rubber plants as agents for and at the expense and risk of Rubber Reserve. The operator was paid a management fee, based on the amount of on-specification synthetic rubber produced. The management fee was designed to cover executive management, legal, medical, technical, and general services not capable of being charged directly to plant operation and to com-

pensate the operator for providing its experience and know-how.

E.g., PX1241 Operating Contracts, tabs 1 and 2

194. Rubber Reserve indemnified the operators from claims of patent infringement as a result of the plant operations, but it assumed no liability for actions "not pertinent to the manufacture of Snythetic Rubber." This indemnification was protected by the operator's grant to the government of royalty-free licenses under their patents to manufacture, use, and sell synthetic rubber. In the case of the Big Four, these licenses passed to the government by virtue of the Exchange Agreement. General, who was not a party to the Exchange Agreement, granted this license in its Operating Agreement.[52]

PX1241 Operating Contract, tab 1 Section 8, pp. 10-12

DX1404 Exchange Agreement, Art. II, Par. 4, pp. 6-7

195. The confidential exchange of technical information relating to the manufacture of synthetic rubber among the operators of the government plants, through Rubber Reserve, was also provided for by agreement. In the case of the Big Four, this exchange was effected through the Exchange Agreement. General, who was not a party to that agreement, was required to provide such technical information by its Operating Agreement, which also provided

52) In its Operating Agreement, General also agreed to offer reasonable royalty-bearing licenses under its patents to manufacture, use, and sell synthetic rubber for commercial operations (as distinguished from government operations) to any operator of a government synthetic rubber plant at Reserve's request, up to 10 years after the end of the National Emergency (April 28, 1962).

that General was to receive reciprocity with respect to certain of this information through arrangements effectuated essentially between Reserve and the other members of the Exchange Agreement. The Operating Agreement provided that:

> "All such technical information shall be maintained secret and confidential and operator shall establish and maintain all reasonable safeguards, including secrecy contracts, to prevent any disclosure thereof to any third parties without the prior written consent of Reserve."

Essentially the same requirements of secrecy were set out in and applied to the exchange of information under the Exchange, Compounding, and Cross-License Agreements.

DX1404
Exchange Agreement, Art. II, par. 3, p. 6
Art. III, pp. 8-10

PX1241
Operating Contract, tab 1, Sec. 8, p. 11
DX1413B
DX1430

196. The Operating Agreements further provided that the operators could be reimbursed by the government for the cost of conducting research and development work relating to processes for the manufacture of synthetic rubber, to the extent approved by the government in advance. The Big Four were credited during their operation of the plants with substantial amounts in reimbursement for research as provided in their Operating Agreements and implemented by other agreements known as "Patent Agreements Relating to Research Work." These Patent Agreements granted Reserve immunity with respect to inven-

tions made in the course of government-reimbursed research in the synthetic rubber field, defined broadly to include not only the manufacture of but also "compounding, vulcanization, use and sale of substitutes for natural rubber." General did not perform any government-reimbursed research under its Operating Agreement, nor did it enter into the Patent Agreements Relating to Research Work, all of which terminated as of March 31, 1949.

PX1241, Operating Contract, tabs 1-2
DX1738, p. 23
DX1655, not executed
DX1413 B and E
DX1682, tab YY, pp. 2, 3
DX1411 B-1
Wilson, B20,547-48

197. The agreements and procedures set out in Findings 191-199 were the foundation upon which the government chose to establish, control, and maintain the synthetic rubber industry, and they continued in effect throughout the wartime period. During this period General operated the Baytown plant for the government under its Operating Agreement, and it participated in the exchange of technical information relative to the manufacture of synthetic rubber provided for by its Operating Agreement. However, General never became a party to the Exchange Agreement, the Cross-License Agreement, the Compounding Agreement, nor the Patent Agreements Relating to Research Work. Further, General did not perform and was not reimbursed for any research work under its Operating Agreement during this period. In fact, General not only chose to avoid the patent pools, but repeatedly objected to the pooling arrangements as being a damper on incentive. General did pursue private unreimbursed

research relating to synthetic rubber, however, including joing research projects with Mathieson Alkali and others.

DX1406, p. 3
DX1407
Swart, B7258-64
DX1405C
DX1405D

198. Following the end of World War II, the entire government synthetic rubber program was re-examined. The Cross-License Agreements expired six months after cessation of hostilities (March 2, 1946), and the Compounding Agreements were to expire at the end of the National Emergency (April 28, 1952). The Exchange Agreements were to terminate in 1951. Further, since the entire program had been handled on a wartime basis, a review of objectives was in order. Such studies were begun soon after the war and culminated in the Rubber Act of 1948 (50 USC App. §1921, *et seq.*) which became effective April 1, 1948.

Ex. Order No. 2974

1948 U.S. Code Cong. Serv., p. 1341 *et seq.*, Legislative History of Rubber Act of 1948

199. The Rubber Act of 1948, which was the controlling expression of national policy with respect to the post-war synthetic rubber industry, recognized that the synthetic rubber industry was not yet in a position to be self-sufficient. Natural rubber was generally considered to be superior to the synthetic then in production; and while natural rubber was subject to wide fluctuations in price depending on supply and demand, the price of synthetic rubber in a competitive economy free of government support was also uncertain. Consequently, in the interests of national security, the Act authorized a temporary continuation of the government powers to allocate, produce, maintain inventory controls, and set specifications for syn-

thetic rubber. It also set a minimum synthetic rubber plant capacity and mandatory consumption requirements for the synthetic rubber produced. The stated objective of the Act, however, was to establish a synthetic rubber industry which would sustain itself in a competitive economy without government support. To this end, the Act set out as national policy that:

> "In order to strengthen national security through a sound industry it is essential that Government ownership of production facilities, Government production of synthetic rubber, regulations requiring mandatory use of synthetic rubber, and patent pooling be ended and terminated whenever consistent with national security, as provided in this Act."

1948 U.S. Code Cong. Serv., p. 1343
Legislative History of Rubber Act of 1948.

50 U.S.C. App. §§1921, 1922

200. It was recognized in the Rubber Act of 1948 that research was a key element in the program, and to that end it specifically called for "continuous and extensive research by private parties and the Government" as being essential. At the same time, the Act directed the President to "effectuate immediate cessation of further accumulation of technical information or rights to patents under the [Exchange Agreement] insofar as practicable and consistent with the purposes of this Act," and to take such action as appropriate with respect to the other wartime patent pooling, licensing, and information exchange agreements.

50 U.S.C. App. §1925
50 U.S.C. App. §1930

201. The Rubber Act of 1948 was directed to the production of synthetic rubber *per se* and its improvement

through research. No authority was conveyed to the government to conduct research on the compounding or utilization of synthetic rubber and particularly not on the development of new end-product compositions such as tires or tire treads.

50 U.S.C. App. §1925

202. To effectuate the policies of the Rubber Act, the government began in late 1948 and continued through 1949 to negotiate with the Big Four to replace the remaining pooling, exchange, and cross-license agreements. Production of synthetic rubber continued throughout this period in the government-owned plants under the various Operating Agreements which were not renegotiated. A chief area of concern was with respect to the negotiation of new agreements setting the proper scope of government reimbursed research and the consequent rights therein, while protecting and excluding therefrom the legitimate proprietary rights of private industry in its congressionally encouraged private endeavors.

DX1642 Wilson, B20,478-86; 20,763
DX1653
DX1699, tab B

203. The Rubber Act of 1948, which called for the termination of the Exchange Agreements, created a situation inimical to the exchange of technical information called for by Section 4, Article III of the Exchange Agreement and Section 8 of General's Operating Agreement.[53]

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53) A cut-off date of March 31, 1949, for the further exchange of such technical information was agreed upon by the Big Four, but General was not a party to this decision. A letter dated September 12, 1949, was prepared by Rubber Reserve to be sent to General informing it that the exchange of such technical information was no longer in effect, but this letter was not sent and General was never so advised.

Also, the apparent production costs of the Baytown plant were sometimes higher than at other synthetic rubber plants since, under its Operating Agreement, General charged its routine items such as quality control to production while the other operators charged theirs to research. Because of these factors, the government wanted General to take a research agreement with the rest of the operators and, accordingly, Reserve began negotiations for the same.

DX1404, Exchange Agreement, Art. III, par. 4, p. 9
PX1241 Operating Contract, tab 1, pp. 10-12
DX1406
PX1334
PX1335
DX1431
DX1694, tab P

204. It would serve no purpose to set out in detail the extensive negotiations referred to in Finding 205. The Court has noted, however, that during the negotiations the government proposed agreements which could have extended the scope of government research and rights into areas of compounding and end products (as had the wartime Compounding and Cross-License Agreements), and that these proposals were rejected by General and the other operators (e.g., PX1349, C-1).

205. On January 17, 1950, General executed a Research Contract with the RFC which recited that it was made and entered into as of January 1, 1949. The whereas clauses of this contract recite that the parties had previously entered into the Operating Agreement for the Baytown plant, which agreement provided for government reimbursement of certain research, experimental, laboratory, development and pilot plant work to the extent ap-

proved in advance; that the President, pursuant to the Rubber Act of 1948, had directed RFC to conduct research as authorized by the Act; and that the Agreement was being made to cover any rights resulting from such authorized research which General was to undertake. The reimbursable research was set out as to kind and amount in Paragraph 1 and corresponding Exhibits A and B, the former covering a six-month period ending June 30, 1949, the latter a fiscal year ending June 30, 1950. Thereafter, reimbursable research for each subsequent period was made by amendments to Paragraph 1 of the contract which were in effect new contracts.

PX1241, Research Contract, tabs 1-8

206. The basic financial arrangements for reimbursement of research performed under General's research contract as well as for the operation of the Baytown plant, are set out in Section 5(d) of an amendment to General's Operating Agreement dated September 1, 1943. Reserve provided the working capital for the operation of the plant by depositing an amount in a special account in a commercial bank. General was allowed to draw on this account to pay all costs of operation such as salaries, supplies, equipment, insurance, taxes, and the like. The account was replenished from time to time upon presentation of an appropriate certificate from General. Excess funds could be withdrawn by Reserve, but General was entitled to withdraw only the amounts needed to pay operating costs; the account was government property. Baytown rubber was sold for the account of and at the direction of the government and proceeds were also deposited as needed in the special bank account. General kept appropriate accounting records which were subject to inspection and were audited. Any conflict as to the propriety of a cost charge was, under Section 4 of the Operating Contract, de-

cided by Price Waterhouse & Company, the auditor agreed upon. The management or operating fee was paid directly to General by the government and was not drawn from the special account.

PX1241 Operating Contracts, tabs 1 and 2
Kelly C1811-13, 1824-26

207. No provision was made in the research agreement for any payment to General Tire. The budget provisions of the research agreement merely authorized the doing of work at Baytown for which payment could be made from the special bank account. Thus, salaries of personnel, wages of laborers, cost of materials, and the like were to be paid from the account but no part of these payments went to General Tire as a corporation, nor did General Tire receive any more or less money because of the budgeted research than it would have received without the research agreement. Under either its Operating Agreement or its Research Contract, General was in the same position with respect to materials or services supplied, other than as agent, as any other supplier. For example, tires for Baytown vehicles might be bought from General or Firestone or others, and it made no difference if the vehicles were employed in research or otherwise. The Research Contract and the various amounts fixed from time to time by the extensions of it merely authorized the charging of expenses within those limits in accordance with Section 5(d) of the September 1, 1943, amendment to the Operating Agreement.

PX1241, Research Contract, tab 1
PX1241, Operating Contract, tab 2

208. The scope of research to be conducted under General's Research Contract was set out in Paragraph 3, which reads as follows:

"3. The applied and developmental Research Work to be conducted hereunder shall be directed to the determination of generally accepted principles for, and to the adaption of such principles to techniques for, the production of rubber-like polymers of butadiene, and of rubber-like copolymers, mixed polymers and inter-polymers of butadiene with styrene; the content of butadiene being within the range of 50% to 100% by weight of the rubber hydrocarbon present. The scope as above indicated excludes any work under or related to Contractor's 'wet smear' invention, covered by Patent No. 2,441,090, but includes carbon black masterbatches and may be further extended by mutual agreement in specific instances."

PX1241, Research Contract, tab 1, par. 3, p. 2

209. In essence, Paragraph 3 of General's Research Contract, defines the area of research as the production of SBR synthetic rubber. In January, 1950 the entire output of the Baytown, Texas synthetic rubber plant operated by General was in the form of carbon black masterbatches. This specific type of masterbatch was also included within the scope of the Contract by the express statement in Paragraph 3 that the scope included carbon black masterbatches. General's "wet-smear" patent,[54] which related to carbon black masterbatches and had issued prior to the contract, was specifically excluded. Research with respect to oil masterbatches, oil-black masterbatches, or the compounding of synthetic rubber was not within the scope of authorized research, nor was research with respect to tires or tread compounds. While provision was made for ex-

54) General's "wet-smear" patent (DX1793) had been conceived and reduced to practice prior to March 13, 1949, the cut-off date for exchange of information under the Exchange Agreement (and therefore General's Operating Agreement). DX1694, tab P.

tension of the scope of research in specific instances by mutual agreement, the only extension ever made was to broaden the term "styrene" to include "alkylated styrenes."

DX1491
PX1241, Research Contract, tab 4

210. Paragraph 4 of General's Research Contract provided that written reports covering reimbursed research work done under the contract were to be submitted to RFC by General. No evidence has been produced which indicates or suggests any failure on the part of General to perform under this section. Accordingly, the Court finds that General fully performed this requirement of its Research Contract.

PX1241, Research Contract, tab 1, par. 4, p. 2

211. Paragraph 5 of General's Research Contract provided that General was to make available to RFC, or its nominees, all information within the scope, as defined in paragraph 3, of research performed, whether reimbursed or not. No evidence has been introduced to indicate any lack of performance under this paragraph.

PX1241, Research Contract, tab 1, par. 5, p. 3

212. Paragraph 6 of General's Research Contract provided that in addition to the information made available under paragraphs 4 and 5, General, upon request, would make available to RFC, or its nominees, information which was outside the scope of paragraph 3 but which was necessary to the use of the information of paragraphs 4 and 5 in the production of SBR synthetic rubber. However, paragraph 6 specifically excluded information pertaining to the "subsequent compounding" of synthetic rubber. The production of a tire or tread compound, which is the subject matter of the invention of the patent in suit, involves

subsequent compounding of synthetic rubber. Further, there is no evidence that any request was submitted by RFC pursuant to this paragraph or that any necessary information pursuant to this paragraph was withheld. Firestone concedes that by June of 1951 detailed information concerning the subject matter of the patent in suit was published by General Tire in India Rubber World.

PX1241 Research Contract, tab 1, par. 6, p. 3
PX1008

213. Paragraph 7 of General's Research Contract set out the license provisions as follows:

> "7. Contractor hereby grants to RFC and its nominees (1) a royalty-free license to utilize without limitation any information or invention (whether or not patented) resulting from the research authorized by this contract, including the right to reproduce, disclose to others, and publish all such information or inventions, and including the right to make, use and sell thereunder, and (2) a royalty-free license to use any information or invention to which RFC or its nominees are entitled under the provisions of paragraph 5 above, including the right to reproduce, disclose to others, and publish all such information or inventions, but limited to the utilization of the same in the production, use or sale of general purpose synthetic rubber suitable for use in the manufacture of transportation items such as tires or camel-back, and (3) a royalty-free license with respect to any information or invention made available under the provisions of paragraph 6 above, limited to the utilization of the same in the manufacture, use or sale of rubber-like polymers, copolymers, mixed polymers and interpolymers of the compositions defined in paragraph 3 above."

The Court finds that the invention of the patent in suit did not result from research authorized by the contract or performed thereunder by General; that no information to which RFC was entitled under paragraph 5 relates to tires or tire treads; that the information to which RFC was entitled under paragraph 6 did not relate to tires or tire treads; and, accordingly, that Firestone is not licensed to practice the invention claimed by the patent in suit.

PX1241 Research Contract, tab 1, par. 7, pp. 3-4

214. In addition to the specific language of General's Research Contract, its entire history contradicts any extension of research or rights into the field of compounding or end products. This history can be expressed succinctly as follows: During the war and thereafter until changed by the effect of the Rubber Act of 1948, the Cross-License Agreement, Compounding Agreement, and Patent Agreements Relating to Research Work[55] did extend government license rights into the field of compounding and end products (Findings 193-194 and 199); and this was done by explicit language. After the war, the national rubber policy was set by the Rubber Act of 1948. This Act did not authorize government-sponsored research in the field of compounding or end uses; it was limited to research designed to improve synthetic rubber *per se* (Finding 201). After passage of the Act, a renegotiation of research contracts specifically omitted any reference to research to be done or rights to be acquired in the fields of compounding, tires, treads, tread compounds, or other end products.

cf. DX1682, tab YY
DX1738, p. 23
DX1413B
DX1430
DX1404

55) General was not a party to these agreements.

215. Firestone has placed great emphasis on the fact that the major use of oil-extended rubber and synthetic rubber generally is in tires.[56] It argues from this that even if the language of General's Research Contract does not give a license with respect to tires or treads, a license should be implied. Firestone says it is inconceivable that the government would have been satisfied with a mere license to synthetic rubber or masterbatches *per se* without the right to use it for its main intended purpose. The Court finds that while the major use of synthetic rubber is in tires, there are other substantial uses for synthetic rubber, including oil-extended rubber (See Finding 28). The Court also finds that there is no evidence, in the Research Contract or elsewhere, that the government intended either to authorize research with respect to end uses such as tire treads or to acquire any rights therein.

216. A further bar to Firestone's implied license argument (referred to in Finding 218) is the fact that a license may not be implied when it is specifically negated by the agreement, understanding, and conduct of the parties. That it was so negated in this case is apparent not only from the face of the Agreement as set out above, but also from the negotiations which immediately preceded the Agreement and which formed a part of the understanding of the parties.

217. On December 7, 1949, Mr. Knowlton, General's chief negotiator and General Counsel, wrote to Mr. Hadlock, the government's negotiator and Executive Director of Rubber Reserve, regarding the meaning of paragraph 7 (the license paragraph) of the government's proposed Research Agreement furnished with Hadlock's letter of No-

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56) About 60% of the rubber in an average passenger tire is in the tread portion.

vember 23, 1949. Messrs. Hadlock and Knowlton discussed the letter by phone on December 9, 1949, and each made notes—Hadlock's on the original and Knowlton's on the retained copy of the December 7 letter. In addition, Knowlton made a separate memorandum on December 9, wrote a letter to Mr. McCoy (General's outside counsel) on December 13, and wrote a confirming letter to Hadlock on December 16. The clear intent of both parties is summarized in the December 16 letter which stated that the words "without limitation" in paragraph 7(1)[57] of the Agreement refer:

> ". . . to the kind of use that RFC may make of the invention and the resulting information relative to production [of synthetic rubber] and do not refer to the subsequent use of the product in other patentable combinations."

Thus, the plain meaning of the terms of the Agreement conforms to the understanding of the parties to it. The Court finds that General's Research Contract excludes any license to use synthetic rubber in a patentable combination [end produce] such as that covered by the patent in suit.

DX1424A-C
DX1425
DX1427
DX1428A-B
Knowlton, B15,035-53; 15,059-63; 15,066-71
McCoy, B21,371-73
Hadlock, B27,496-98

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57) There was no question about the license-granting provisions of paragraphs 7(2) and 7(3) which on their face limit any license to synthetic rubber *per se* and do not extend to end products.

218. Other facts contradict Firestone's argument that a license should be implied (Finding 215). These are set out briefly as follows:

(a) At one stage of the negotiations for the Research Contract, the draft contained language which could have extended coverage to compounding. This draft was rejected, and the disputed language was removed from the final draft. The government is now estopped to imply coverage into areas specifically excluded during negotiations.

(b) At about the same time that General's Research Contract was being executed, the modification of the Exchange Agreement was signed by the Big Four, RFC, and others. This modification had the effect of modifying that pooling arrangement in certain significant respects *ab initio* and of terminating it retroactively to March 31, 1949.[58] Approval for such modifications and the various agreements which followed had been given by the RFC Board of Directors on December 23, 1949. This approval made clear the fact that the RFC considered the Research Contracts to be narrower than the Exchange Agreement and to exclude information to compounding. The approval stated that:

"Signatories to the [Exchange] Agreement conducting research sponsored by R.F.C. (Goodyear, Firestone, U.S. Rubber, Goodrich, and Phillips) have executed, effective March 31, 1949, research agreements which narrow the scope of the research, provide for disclosure to R.F.C. (with limited rights

58) The modification limited the licenses granted by the Exchange Agreement to inventions conceived and reduced to practice prior to March 31, 1949, and set that date as a cut-off of any further accumulation of technical information.

of user) of information within the scope which may be developed privately by the company after March 31, 1949, and during the remaining term of the research arrangements and provide for the availability to R.F.C. (with limited right of user) of information in the possession of the company after March 31, 1949, and during the remaining term of the research arrangement, which is outside the scope of the research conducted for R.F.C., but which is necessary in connection with the use of the information resulting from the R.F.C. sponsored research work, excluding compounding and the preparation of raw materials, catalysts or other ingredients used in the manufacture of synthetic rubber.

(c) The government has never asserted any license rights to General's invention, nor to the oil masterbatch *per se*.[59]

RFC did not request information concerning the invention or the oil masterbatch from General under any of the provisions of the Research Contract, even after the fact of the invention had been announced.

(d) The standard representations made by the government in the sale of synthetic rubber also show that the government was interested only in synthetic rubber *per se*. Its General Sales and Distribution Circular provided:

"Rubber Reserve warrants that the standard types of synthetic rubber sold by it conform to the aforementioned specifications, but makes no representation or warranty of any kind, express or implied, as to their use, or the results to be obtained from such use."

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59) General has never asserted the patent in suit against manufacturers of the oil masterbatch *per se* or the synthetic rubber industry.

Similar disclaimers were made in connection with the sale of the government synthetic rubber plants.

(e) A memo prepared by Firestone's counsel on March 17, 1961, shows that the government had taken a positive position that it was not interested in General's patent covering tires and tire tread stocks. That memo refers to a proposed "approach to Attorney General to reverse position of Justice Department in respect to whether General Tire patent is within General Tire research contract." This statement is not considered as evidence of the legal issue of whether the patent is licensed to the government but rather as evidence that no license can be implied from the conduct or statements of the parties.

(f) During the disposal of the government-owned synthetic rubber plants, no bidder for a plant listed a patent on tires or tire tread stocks in its claim of right, made pursuant to instructions that each bidder set out the rights it claimed relative to the operation of the plants. (See Findings 229-234 for details.) Firestone specifically said it knew of no one's patents that it needed in order to operate Lake Charles or sell its products. Nor did it state any contingency as to its ability to sell oil-extended rubber for tires, as required by Section (h) of the bidding instructions. General listed a number of patents it said might be needed for operating Baytown and offered to pay reasonable royalties thereunder.

(a) DX1420
DX1682 MM
(b) DX1694 tab P
(c) DX1684B
(b) DX1699 tab B
(d) DX1752, pp. 3 & 20
(e) DX1840
FX2638
FX2649

219. Firestone also argues that General did work on evaluation of Baytown synthetic rubbers in oil masterbatches and that therefore the language of General's Research Contract should be construed to give the government a license not only to the oil masterbatch but to its manufacture, use, and sale, including its use in tire treads. This contention fails for a number of reasons:

(a) The specific inclusion of "black masterbatches" in scope paragraph 3 necessarily excludes "oil masterbatches" or "oil-black masterbatches." As previously found, oil masterbatches are not within the scope of paragraph 3 of the Research Contract.

(b) Even if oil masterbatches were included within the scope of paragraph 3, no invention, much less the invention of the patent in suit, is alleged or shown to have resulted from any research authorized or carried out under the Research Contract, either with respect to oil masterbatches, tire treads, or tread compounds.

(c) Even if the government were entitled to a license on the oil masterbatch, it would not extend to its use in other patentable combinations (such as the invention of the patent in suit). The right to "use" an oil masterbatch (in the grant to "make, use or sell") refers to the use of the masterbatch itself so long as it retains its separate identity. It does not retain its separate identity when mixed with other ingredients to form a tread compound and extruded to form a tread stock or tire tread.

(c) DX1677 Wilson B20,659-61

220. This Court finds that the government was not entitled to a license, expressed or implied, under the patent in suit, nor to the subject matter of General's invention.

221. Since the Court finds no license in the government, it is not necessary to reach the question of whether Firestone derived such a license from the government. For purposes of appeal, however, the Court makes the following Findings 222 to 226 with respect to this question.

222. Firestone contends that it stands in the government's shoes with respect to license by virtue of the fact that it was made a nominee at the time it purchased the government-owned synthetic rubber plant at Lake Charles, Louisiana which had been operated for the government by Firestone. This nomination consists of a document dated April 22, 1955, whereby the government Rubber Producing Facilities Disposal Commission granted Firestone whatever rights the government had under some 75 government contracts going back to and including the Exchange and Cross-License Agreements and including therein General's Research Contract, as amended.

PX1241 Nomination Contract

223. The nomination recites that it was made at Firestone's request and that it was considered by the Commission to be necessary or appropriate to effectuate the purposes of the Disposal Act (50 App. U.S.C. 1941) enacted August 7, 1953. That Act, in turn, sets out its purpose as being the sale of the government-owned synthetic rubber plants to private industry to effectuate the policy of the Rubber Act of 1948 with respect to the development of a free, competitive synthetic rubber industry in the United States.

224. The nomination agreement, under which Firestone makes its claim of license, is limited in two respects. First, it is limited specifically to the purposes of the Disposal Act of 1953; and, secondly, it is limited specifically to rights arising from General's Research Contract (which

was amended several times) "as amended and extended." The amendments to the Research Contract, which are significant here, are as follows:

(a) An amendment of paragraph 3 to include "alkylated styrenes." Inasmuch as such styrenes are not involved here, this amendment is important only to show that the scope of paragraph 3 was never significantly changed.

(b) Exhibits A, B and C to paragraph 1 of the Research Contract were not a part of that Contract after June 30, 1950, and especially not at the time of Firestone's nomination in 1955 to the Agreement as amended.

(a) PX1241 Research Contract, tab 4
(b) PX1241 Research Contract, tabs 1 & 2

225. The Court finds that even if the government were entitled to a license under the patent in suit (contray to Finding 220) this license was neither necessary nor appropriate to the operation of the synthetic rubber plants purchased from the government by Firestone and, therefore, it was not within the policy of the Disposal Act or authority of the Disposal Commission to grant this license to Firestone. No consideration was given for such a license by Firestone; it was not a portion of the consideration passing to the government for the rubber plants; and it cannot be implied that it was the intent, nor was it a fact, that such license was granted to Firestone by way of the nomination of April 22, 1945.

WAIVER

226. Firestone contends that even if it is not entitled to a license under the patent General has waived its right to enforce the patent against Firestone by virtue

of alleged misleading statements made in its bid to purchase the Baytown, Texas plant. A certain amount of background is necessary to the examination of this defense.

227. By 1953, cold rubber and oil-extended rubber had become widely accepted, and Congress enacted the Rubber Producing Facilities Disposal Act, announcing that the disposal of the government-owned synthetic rubber plants was consistent with national security and the policy of the Rubber Act of 1948. A Commission created by the Act to carry out the sale of those plants to private industry advertised for, and received, bids for their purchase; and by 1955 most had been sold.

50 U.S.C. App. 1941(a) *et seq.*

228. The Disposal Commission issued instructions to prospective bidders for the synthetic rubber plants, setting forth certain requirements. Of relevance to the issue of waiver was subparagraph 3(f) of these instructions which has been referred to as the "claim of right" section and which provided as follows:

> "f. In the event that a prospective purchaser claims, or intends to claim, directly or indirectly, any 'right' as defined below, with respect to any process, device, or product presently in use in any rubber-producing facility, or which is necessary to permit the use of any such facility for the purpose for which it was designed and constructed, he shall include in proposal to purchase a statement of the basis of his claims. As used in this paragraph, the term 'right' means right to a royalty or license fee, or right to exclusive proprietary interest, or power to grant immunity, or right to disclose technical information or trade secrets."

FX2638 Appendix-Release No. 1, par. 3(f)

229. The instructions referred to in Finding 232 also required:

> "(h). A clear statement, where a proposal is submitted subject to any conditions or contingencies, spelling out fully and separately each such condition or contingency."

FX2638 Appendix-Release No. 1, par. 3(h)

230. General submitted two bids for the Baytown, Texas plant. The first was submitted on about May 25, 1954, and the second in April, 1955. Neither was accepted. Firestone also submitted bids for the Lake Charles, Louisiana and Akron plants it had been operating for the government. These bids were submitted about May 20, 1954, and were accepted. The contracts for purchase by Firestone were executed December 22, 1954.

FX2639, pp. 41-50, 58-64
FX2650
FX2651
50 U.S.C. App. 1941 W(a)
Kuykendall C 1932-41

231. General did not make a "claim of right" with respect to the application for the patent in suit (which was then pending in the Patent Office) in either of its bids for the Baytown plant. Pursuant to Section (h) of the instructions to bidders, pertaining to conditions, General did make reference to the application for the patent in suit, which previously had been assigned to a Brazilian subsidiary, Pneus General.

FX2639, pp. 58-64

232. In November, 1954, the Disposal Commission abstracted the "claim of rights" section from all of the

bids it had received for the synthetic rubber plants and circulated this compilation among the various bidders. Firestone's copy is date-stamped December 6, 1954. The abstract from General's bid reads as follows:

"f. The Company is the owner of the U. S. Patent 2,441,090 relating to a method of making a mix of carbon black and synthetic rubber polymer of a conjugated diolefin. This process is also known as 'wet smear' or 'black masterbatch.'

"The Company also must make satisfactory arrangements with owners of inventions upon which applications for patent may be pending which cover various phases of the operation of the facilities. One of these inventions is the oil-extended rubber process owned by Pneus General S.A., Rio de Janeiro, Brazil."

The first section of this abstract was taken from the "claim of rights" section (f) of General's first bid. The second section was taken from the section pertaining to "further" conditions.[60]

PX1306 tab N
FX2649
FX2639, pp. 58-64
PX1001

233. Firestone's bid for the Lake Charles rubber plant made the following statement under Section (f) of the instructions to bidders:

"We know of no rights under patents or technical information which our Company or any other lessee or owner of (Plancor 1056) would be required to purchase in order to properly operate (as currently con-

60) At the time of General's bids, its application for patent contained claims directed to oil-extended rubber, *per se*.

ducted) and dispose of the products of said plants, for private benefit. Therefore (Firestone) does not claim nor intend to claim, directly or indirectly, any 'right' with respect to any process, device, or product presently in use in the rubber producing facility, of which is necessary to permit the use of any such facility for the purpose for which it was designed and constructed. The term 'right' means right to a royalty or license fee, or right to exclusive proprietary interest or power to grant immunity, or right to disclose technical information on trade secrets."

Under Section (h) of the instructions, Firestone spelled out no contingency relative to tires or tire treads, nor did Firestone include as a condition that any pending patent application might interfere, if issued as a patent, with its operations at Lake Charles.

PX1306 tab N
FX2649

234. From the facts set forth in Findings 230-37, Firestone contends that General misled it and the government by not making a "claim of right" in its bids for the Baytown plant to the application which later issued as the patent in suit; that Firestone relied upon this failure to make a "claim of right" in submitting its bids for the government plants; and that General has therefore waived its right to assert the patent against Firestone. The Court finds that this contention fails for several reasons:

(a) At the time of its bids, General did not have a "right" in its invention as that term was used in paragraph 3(f) of the instructions to bidders. The development was included in a then unenforceable application, which in fact did not issue as a patent until 1960, five years after the government plants were sold and then only after suit

brought against the Commissioner of Patents. No claim in the issued patent is the same as any claim in the application of 1954. Moreover, as shown by the abstract circulated by the Disposal Commission, no bidder made a claim of right with respect to a patent application, nor with respect to any patents covering tires, tread stocks, or other end products.

(b) General has not been shown to have asserted the issued patent or any "claim of right" against Firestone arising from its operation of, nor any activities associated with, its synthetic rubber plants. Therefore, Firestone was neither misled in fact, nor damaged.

(c) There is no credible evidence that Firestone inquired about, relied upon, was misled, or was damaged by the fact that General did not make a claim of right with respect to the application for the patent in suit. In fact, Firestone's bids were submitted before General's and before knowledge of what was contained in General's bids, so far as the record shows (Finding 234). Firestone had received the abstract of General's first bid on December 6, 1954, before it executed its contract to purchase the Lake Charles plant on December 22, but no changes were shown to have been made by Firestone as a result thereof.

(d) General was under no legal duty to make a claim of right with respect to its invention or forever waive it. Its bids, and the claims or lack of claims made therein, were refused by the government and General never did purchase the Baytown or any other government plant. It built its own plant at Odessa, Texas. General's claims, like those submitted by other bidders, were distributed by the Commission to all bidders with the statement that they did not "constitute any representation whatsoever by the Commission." They constituted no representation to Fire-

stone by General that it would not enforce a then non-existent patent (if ever obtained) against tire makers, nor could it be reasonably concluded that General had made any such representation.

PX1001	FX2649
DX1001	GX2682, tab 47

ESTOPPEL AND UNCLEAN HANDS

235. Firestone also contends that even if there is no license to the government and no waiver on General's part as discussed in the above findings, nevertheless General is estopped from enforcing the patent against Firestone. This estoppel argument is founded on the allegation that General was guilty of unclean hands in essentially two forms: One, the transfer of the U. S. patent application to General's Brazilian subsidiary Pneus General in 1951 and the re-transfer to General in 1959, said to be an effort to avoid General's obligations under the Research Contract; and, two, the allegation that General was careful to separate its private research from the work it was doing under its Research Contract, said to be a breach of its fiduciary obligations to the government as agent for the operation of the Baytown plant.

236. The Court finds the contention set forth in Finding 239 is without merit. General began work on its invention, and the same was conceived, before it entered into any research agreement with the government or accepted any government reimbursement for research. All of the work leading to the invention was private research paid for by General. General had a duty to preserve these rights and not intentionally or carelessly to throw them away. It would, therefore, have been improper for General not to take steps to preserve this private work for itself and separate it from other research work being

done for the government. Such steps were taken immediately by General, and it so informed the government watchdog for their Research Contract, Price Waterhouse. General did everything possible to keep this invention separate. Such activities do not constitute unclean hands; they represent a carrying out of the policy of the Rubber Act of 1948 to encourage private as well as government research. Further, it is not General's intent, motives, or objectives that are relevant; rather, it is what was within the coverage of the license provision of its Research Contract.

DX1001
Findings 66-78
DX1943 (Plant Memo Feb. 1, 1950 copy to Price Waterhouse)
50 U.S.C. App. 1921 *et seq.*

237. Firestone's estoppel defense has no independent standing apart from the alleged main license defense. Either the government was entitled to a license or it was not. If it were so entitled, that would settle the license issue so far as the government and General are concerned. If it were not entitled to a license or information under the Research Contract (and the Court finds that it was not), then General was well within its rights and duty in refusing to disclose its privately-owned invention to the government and in taking steps to keep it separate from the government research. General's separation of its private work could not (and did not) create a government right where none existed under the Research Contract.

238. General's transfer of its patent application to Pneus General and its subsequent re-transfer to General are also irrelevant. General does not contend that the transfer had any effect on the government's alleged right to a license. If the government had such right, the right

would exist irrespective of the transfer. If it did not, and the Court finds it did not, the transfer is irrelevant.

239. The Court finds that the invention of the patent in suit is not licensed to the government or Firestone, that General has not waived its right to assert the patent, and that it is not estopped by its conduct from so doing.

MISCELLANEOUS DEFENSES

240. Firestone has asserted that the patent is invalid for failure to comply with 35 U.S.C. 112. It says that the patent does not describe the invention clearly enough to enable one skilled in the art to practice the invention and that the patent does not distinctly claim the subject matter of the invention. There is no evidence that anyone skilled in the art has had any difficulty in practicing the invention as described in the patent. There is no evidence that the claims fail to distinctly define the invention or that a man skilled in the art, acting in good faith, could not determine whether his product is within the claimed invention.

241. Firestone's contentions with respect to its 35 U.S.C. 112 defense are semantical and without substance. For example, Firestone argues that General's Claims are defective because one cannot measure the Mooney of the rubber in a tire after it is vulcanized or in a tread stock after it has been made. There is no difficulty in measuring the Mooney of the rubber before it is compounded, however, and it is not reasonable to assume that one skilled in the art would contemplate any other means of measurement, reading General's claims. Indeed, Firestone was shown to have used the same form of claim in its own patent applications.

DX2032 GX2523
B34,774-81; 34,791-94; 34,800-02; 34,807-09

242. Illustrative of Firestone's semantical approach to the claims is the series of tests performed for Firestone by Dr. Semon and designed to show that the polymer characterization test of Claim 1 is indefinite. Approximately 100 trial runs were made by Dr. Semon in an attempt to find types of oils and carbon black which would give widely differing results when used in performing the Mooney test of the claim. Some of the oils used were specifically stated by their manufacturer to be unsuitable for use in tire tread compounds. Dr. Semon admitted that these oils (which included Quaker State motor oil) had never been used in tire tread compounding before to his knowledge. The carbon blacks used were not of the type called for by Claim 1, and two of the three used (HAF-HS and HAF-LS) were admitted to be new types of carbon black not even in existence at the time the patent issued.[61] The third type, high modulus furnace black, is not a high abrasion furnace black as called for in the Claim 1 test. These tests do not support Firestone's contention that the Claim 1 test is indefinite. In tests which used a high abrasion furnace black called for in the Claim 1 test, the results were not only definite, certain, and reproducible, but also supported General's charge of infringement. In short, there is no evidence that the Claim 1 test or any of their other alleged instances of indefiniteness would cause any difficulty to one of ordinary skill, seeking success instead of failure. The patent is addressed to the former.

GX2588
GX2589
GX2636
GX2521, p. 17
DX1288, p. 245
FX2530

Semon, C4267-68; 4287-88; 4321

61) For this reason, those tests were stricken by the Court.

243. Firestone alleges that the patent is invalid because General fraudulently procured the patent. There is no evidence to support this allegation. The Court finds that no fraud was committed or attempted by General.

244. Firestone also alleges that the patent is unenforceable because of an alleged misuse by General. This issue was first raised by Firestone's motion to dismiss and determined adversely to Firestone by the Court in its Memorandum and Order of June 22, 1970. That Memorandum constitutes the Court's findings and conclusions with respect to the issue of misuse. At the trial, Firestone offered some evidence in addition to the settlement agreements which it had relied upon in its motion to dismiss. This evidence has been considered by the Court, but it does not support the charge of misuse, nor add in substance to the evidence previously considered.

245. In view of the findings of fraud set out in the Court's Memorandum and Order of June 22, 1970, the Court finds that the Baltimore case, C 67-206, is an exceptional case within the meaning of 35 U.S.C. 285; a decision on whether to award reasonable attorneys' fees and the punitive damages claimed will be reserved until a hearing following the report of the master in this case.

246. Any finding of fact entered herein which may be construed in whole or in part as a conclusion of law shall be so deemed and treated as if set forth under the Conclusions of Law herein.

CONCLUSIONS OF LAW

1. The Court has jurisdiction of the parties and subject matter of Civil Actions Nos. 36,799 and C 67-206. Venue lies in this district.

2. United States Patent No. 2,964,083 was duly and lawfully issued December 13, 1960. It is and at all material times has been owned by The General Tire & Rubber Company (hereafter, General).

3. Claims 1, 3-5, 7, 13, 14, 17-19, and 22 of U. S. Patent No. 2,964,083, the representative claims here in issue, are in all respects valid and enforceable.

4. Stock A, Blend 2, and Blend 5, the representative infringing tread stocks here in issue, infringe each of representative Claims 13, 14, 17-19, and 22; and, when applied as the vulcanized tread portion of a pneumatic tire, they infringe each of representative Claims 1, 3-5, and 7.

5. The subject matter of the representative claims in issue is not and has never been licensed to The Firestone Tire & Rubber Company (hereafter, Firestone) nor to the government, either expressly or impliedly.

6. General is entitled to an injunction restraining further infringement of the patent in suit by Firestone.

7. General is entitled to an accounting to determine damages and loss of profits arising from Firestone's infringement of the patent in suit, both as to the representative products here found to infringe and all other products.

8. General is entitled to an award of costs in Civil Actions Nos. 36,799 and C 67-206.

9. Any finding of fact entered herein which may be construed in whole or in part as a conclusion of law shall be so deemed and treated as if set forth as a conclusion of law herein.

ORDER AMENDING FINDINGS OF FACT, CONCLUSIONS OF LAW AND MEMORANDUM OPINION AND ORDER ISSUED JUNE 26, 1972 (Nos. 36,799 and C67-206)

(Filed September 18, 1972)

Pursuant to Rule 60(a) of The Federal Rules of Civil Procedure, this court wishes to correct certain clerical errors contained in the Findings of Fact, Conclusions of Law and Memorandum Opinion and Order in the above captioned causes issued June 26, 1972

FINDINGS OF FACT & CONCLUSIONS OF LAW

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1. Line 6 of finding 31 is amended to read 50–5.
2. Line 6, page 26 is changed from CX1050 (AO75050) to BX1050 (AO75050)
3. Line 4, page 36 is changed from PX1221, tab B to PX1221, tab A.
4. The following is added to page 56 (finding 134): "Natural rubbers. The rubbers used in Example 2 is described as a "commercial butadiene-styrene copolomer synthetic rubber latex."
5. DX1413E is stricken from line 20, page 88.
6. DX1413E is eliminated from the last line of page 89.
7. DX1413E is eliminated from the fourth line from the bottom, page 92.
8. DX1046, page 3 and DX1407 are stricken from lines 20 and 21, page 93.
9. DX1642 is stricken from line 9, page 96.
10. (c) DX1677 is stricken from line 22, page 110.
11. GX2636 is stricken from line 10, page 122.

MEMORANDUM OPINION AND ORDER

1. Line 17, page 3 is changed from *Solomon v.* to *Sanford v.*
2. Page 18 is changed by striking the following citations: *FMC v. F. E. Myers & Bro. Co.*, 384 F.2d 4, 9 (6th Cir. 1967), cert. den., 390 US 988 (1698); *Elizabeth v. Amercian Nicholson Pavement Co.*,

97 US 126, 135-6 (1878); *The Barbed Wire Patent*, 143 US 275, 285, 292 (1892); *Warren Bros. Co. v. City of Owosso*, 166 F. 309, 315-6 (6th Cir. 1909), cert. den., 214 US 523 (1909); and adding: *Ushakoff v. United States*, 327 F.2d 669, 671-72 (Ct. Cl. 1964).

3. Line 11, page 30 is amended by striking the word *proposed*.

IT IS SO ORDERED

/s/ Frank J. Battisti
Chief Judge

UNITED STATES DISTRICT COURT
Northern District of Ohio
Eastern Division

Civil No. 36,799

GENERAL TIRE & RUBBER COMPANY,
Plaintiff,

vs.

FIRESTONE TIRE & RUBBER COMPANY,
Defendant.

Civil No. C 67-206

FIRESTONE TIRE & RUBBER COMPANY,
Plaintiff,

vs.

GENERAL TIRE & RUBBER COMPANY,
Defendant.

JUDGMENT ORDER
(Filed October 3, 1972)

Battisti, *C.J.*

It is hereby ordered and adjudged:

1. That this Court has jurisdiction of the parties and subject matter of these actions.

2. That United States Letters Patent No. 2,964,083 was duly and lawfully issued and has since been owned by the General Tire and Rubber Company.

3. That claims 1, 3-5, 7, 13, 14, 17-19 and 22 of said patent in suit, the representative claims here in issue, are in all respects valid and enforceable.

4. That Stock A, Blend 2 and Blend 5, the representative tread stocks here in issue, infringe each of representative claims 13, 14, 17-19 and 22 and when applied as the vulcanized tread portion of a pneumatic tire they infringe each of representative claims 1, 3-5, and 7.

5. That the subject matter of said patent in suit is not and has never been licensed to the Firestone Tire and Rubber Company, either expressly or impliedly.

6. That a writ of injunction issue out of and under the seal of this Court, directed to the Firestone Tire and Rubber Company, its officers, agents, servants, employees, attorneys, successors, assigns, and those in privity with them, enjoining and restraining them from directly or indirectly infringing claims 1, 3-5, 7, 13, 14, 17-19 and 22 of United States Letters Patent No. 2,964,083, and from inducing, aiding, abetting, advertising, or in any way contributing to the infringement of said patent claims.

7. That the General Tire and Rubber Company recover from the Firestone Tire and Rubber Company the damages to which it is entitled by law for the infringement of said patent in suit, together with such attorneys' fees, punitive damages, expenses, costs and interest as after the report of the Special Master may be determined and awarded by this Court.

8. That these actions are hereby referred to a Special Master to be designated by this Court to make and render an accounting as to the extent of infringement by defendant of said Patent No. 2,964,083 and the amount of damages suffered by the General Tire and Rubber Company on account thereof and to report to this Court his recommendation as to the amount that the General Tire and Rubber Company should recover from the Firestone Tire and Rubber Company, including recommendations with relation to the costs of the accounting and interest to be borne by the Firestone Tire and Rubber Company. Said accounting is stayed until there has been a final determination of the issues of validity and infringement.

9. This injunction is stayed until there has been a final determination of the issues of validity and infringement.

10. No bond is required since Firestone's financial position is sound. Therefore, Firestone is left to its own recognizance in providing General's security herein.

IT IS SO ORDERED.

/s/ Frank J. Battisti

Chief Judge

APPENDIX D

Opinion and Findings of the United States District Court for the District of Maryland—October 17, 1966 (264 F. Supp. 291)*

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* Pertaining to the issue of Firestone's fraud on the courts.

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MARYLAND

Civil Action No. 12932

THE FIRESTONE TIRE & RUBBER COMPANY

v.

THE GENERAL TIRE & RUBBER COMPANY

[264 F.Supp. 291]

Memorandum on Defendant's Renewed Motions To Transfer and To Impose Sanctions

The defendant, The General Tire & Rubber Company (General), has renewed its motion of April 13, 1961 to dismiss or transfer, and its motion of September 6, 1963, to transfer, this case to the United States District Court for the Northern District of Ohio, Eastern Division. Defendant further moves that sanctions be imposed upon plaintiffs,[1] including General's attorney fees and expenses arising from the prosecution of Civil Action No. 12,932, and an equal amount "against plaintiffs payable to the Court to compensate for plaintiffs' gross imposition upon the Court and hardship caused other litigants by plaintiffs' fraudulent monopolizing of over two and one-quarter years of the Court's time . . . [and] for such other penalties, sanctions, and relief as the Court may see fit."

The Court is also requested to enter certain proposed Findings of Fact.

The motions are stated to be based, "in addition to the grounds set forth in the documents supporting the previous transfer motions, upon newly discovered evidence which

[1] Plaintiff McCreary and defendant General have reached a settlement and the Amended Complaint of McCreary has been dismissed with prejudice.

was kept from defendant by plaintiffs, although it was in the possession and control of one or both plaintiffs and known by them prior to the transfer motions of April 13, 1961 and September 6, 1963. The motions are also brought following the suggestions of the Court of Appeals in Case No. 10,429, at pages seven and eight of its opinion. [General Tire & Rubber Company v. Watkins, 4 Cir. 1966, 363 F. 2d 87, 89-90]."

Significantly, there is no renewal of, or even mention of, defendant's motion of October 12, 1965, seeking, among other things, a dismissal of the declaratory judgment action of McCreary Tire & Rubber Company (McCreary), a dismissal of the declaratory judgment action of The Firestone Tire & Rubber Company (Firestone), or in the alternative, a dismissal of the non-infringement portions of the declaratory judgment action; and to charge Firestone and McCreary "with costs, expenses and attorney fees resulting from their improper declaratory judgment action and conduct", and such additional relief as the Court may consider proper.

No mention is made of the Supplemental Statement filed by defendant on October 26, 1965, in support of the motion filed October 12, 1965. This Supplement is primarily related to meetings in March 1961, purportedly involving the relationship of Goodyear Tire and Rubber Company and United States Tire and Rubber Company to this litigation.

Finally, no mention is made of this Court's ruling on December 13, 1965, denying the motion of October 12, 1965 as supplemented on October 26, 1965, raising substantially the same contentions as are made herein, nor of the Court's oral opinion thereon (Transcript, pages 26,987-27,010).

In General Tire and Rubber Company v. Watkins, supra, the Court of Appeals said (363 F. 2d at pages 89-90):

> "Since the oral argument McCreary and General Tire have filed certain papers in this court in an

effort to amplify the record. They are bottomed upon what purports to be a tape recording of a telephone conversation between a former president of McCreary and one of the lawyers for Firestone. It is suggested that there was falsity in the plaintiffs' representations—in opposition to General's original motion to transfer the case to Ohio—that McCreary was an independent party prosecuting the case at its own expense. These representations may well have been the determinative factor in the denial of the transfer motion. If they were in fact untrue, it appears that the plaintiffs may have practiced a serious fraud upon the District Court.

"However, these papers are not germane to the present petition for mandamus to disqualify the District Judge, and the propriety of the earlier motion to transfer is not now before us. If the tape recording constitutes newly discovered evidence warranting reconsideration of the motion to transfer or any other relief, or the imposition of any sanction, it should first be presented to the District Court, with a motion stating what relief is claimed. After a hearing, the District Court will be in position to determine the authenticity of the tape recording, the truth and materiality of any representations made to the court earlier, and to grant whatever relief may be appropriate.

"After the District Court has acted upon an amplified record, this court can entertain any issue appropriately brought up for review. Until then, any application based upon the tape recording or a claim of earlier misrepresentation should be addressed to the District Court."

Neither side has asked to take further testimony, or otherwise to amplify the record. However, oral argu-

ment was had on September 19, 1966, and on September 26, 1966, the Court advised counsel that the motion had been denied—this memorandum states the reasons therefor.

In its Memorandum in support of the present Motions defendant says (pages 1-2):

> "Pursuant to this clear invitation of the Court of Appeals, defendant has renewed its April 13, 1961 motion to dismiss or transfer and its September 6, 1963 renewed motion to transfer. The foundation for the present renewed motion is the *newly discovered cridence* comprising DX 1840, the 'backfire' memorandum, and the dictaphone recording of the May 9, 1961 telephone conversation between Mr. Birch and Mr. Harry C. McCreary, Sr. (R. 33,325-33,330." (Emphasis supplied).

DX 1840 was filed September 30, 1965, well before this Court's opinion of December 13, 1965, denying defendant's motion to dismiss as supplemented (which raised issues presently before the Court) so that the only "newly discovered evidence" is the dictaphone recording, certain papers in McCreary's files (McCreary Exhibit 1-7), and the testimony with respect thereto. This Court might well confine its consideration to the significance, if any, of this newly discovered evidence on the claim of fraud. Since, however, the charge is so serious, and defendant attacks the professional integrity of Firestone's attorneys, including the credibility of Firestone's house counsel, who is also an attorney, although not engaged in court appearances, the Court will consider all of the grounds advanced by defendant in defendant's Memorandum and proposed Findings of Fact.

1. *The Origin of this Litigation.*

Defendant contends that Firestone brought this action at the invitation of Goodyear and U. S. Rubber to delay and disrupt the Ohio litigation. Reference is made to a claimed "backfire" suggestion of Mr. Kenyon; the signifi-

cance of DX 1840; and the claim is made that the distaphone recording showed that some secret agreement existed between Firestone and McCreary. The same contentions, including the one that there was an undisclosed agreement between Firestone and McCreary (but not, of course, relying upon the dictaphone belt), were made by defendant in its Memorandum in support of its October 12, 1965 motions; together with an attack upon the "chameleon testimony" of Clark, Firestone's house patent counsel.[2]

These contentions, except as to the significance of the dictaphone belt, were in effect found to be lacking in merit by this Court's ruling and oral opinion of December 13, 1963 (Transcript, pages 26,987-27,010, and especially 26,991, where there is a reference to the "backfire"; and 26,991-26,993 where the New York conferences are mentioned).

However, that there may be no doubt, the Court, after a consideration of the record, and particularly the testimony of Mr. Clark, both by way of deposition and in open court; DX 1840; and the exhibits to defendant's Supplemental Statement, filed October 26, 1965, finds that the substance of the New York conference on March 17, 1961 is as stated by Clark in Transcript, pages 22,230-22,244; that the conference was initiated by Clark to consider trial tactics by Firestone, including the place where a declaratory judgment suit should be filed and the possible effects of an earlier decision in either the Cleveland, Ohio litigation or where Firestone might sue; that the instant litigation was not at the suggestion or request of United States Tire and Rubber Company and/or Goodyear Tire and Rubber Company, but was a bona fide and independent effort on the part of Firestone to secure an adjudication in a circuit other than the Sixth Circuit; that the joinder of McCreary

[2] This attack is repeated in defendant's Response to Plaintiff's Proposed Findings in opposition to defendant's Motions to dismiss or transfer, to transfer and for the imposition of sanctions.

was a last minute idea, stimulated by the inclusion in the draft complaint of a reference to an alleged world-wide license; and that no fraud was attempted or perpetrated upon the Court as to the origin of the litigation.

This finding is made because the Court is satisfied that the witness Clark testified honestly in his deposition and in court. The Court has also taken into consideration his general demeanor on the stand and that the discrepancies, if any, were insubstantial; and that his inabilities to recall were because of, and consistent with, the passage of time and the absence of memoranda kept by him.[3] These conclusions are fortified, as to the March 17, 1961 meeting, by the Answers to Interrogatories, filed by defendant on October 26, 1965, with respect to Messrs. Kenyon and Mandelbaum, attorneys for United States Rubber Company, and Mr. J .A. Fowler, Jr., attorney for Goodyear Tire and Rubber Company. Messrs. Kenyon and Mandelbaum are reported as stating, with regard to Transcript, pages 22,230-22,244, that "So far as concerns their recollection of the events that occurred at the meeting of March 17, 1961, their recollection is in general[4] in accord with the aforesaid testimony." As to Mr. Fowler, reference is made to Mr. Clark's testimony on September 30, 1965, and it is stated:

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[3] On reaching these conclusions the Court has considered McCreary exhibits one through seven submitted by Mr. Walter J. Blenko, Jr. at the time of the hearing of April 26, 1966 in this court and has found the discrepancies, if any, between Clark's testimony and Mr. McCreary Sr.'s memoranda relating to their communications prior to the filing of the instant suit insubstantial and of no materiality on the issues involved in the current motions.

[4] Defendant apparently argues that because Messrs. Kenyon and Mandelbaum agreed "in general" they should have stated any particulars in which they did not agree. The Court construes the statement attributed to them to mean that while they might have used language different from Clark's, in substance they agreed with him. Clearly their language does not permit of a construction that they disagreed on any material aspect or statement.

"Mr. Clark in his answers stated his recollection or speculation, and Mr. Fowler is not in a position to disagree with such answers."

2. *The "Agreement" between Firestone and McCreary.*

The question of agreement between Firestone and McCreary as to McCreary's responsibility seems to have been considered under four topics or aspects—(a) indemnity or hold harmless; (b) dependence or independence; (c) liability for expenses; and (d) "secret." These will be considered in the same order.

(a) Indemnification or hold harmless.

All the testimony, and the answers to an appropriate interrogatory are to the effect that there never was any agreement by Firestone to hold McCreary harmless, or to indemnify it, with respect to this litigation. Except as it may be implicit in the claimed "secret" agreement[5] there is no serious countention that any such indemnification or hold harmless agreement existed.

The Court finds as a fact that there was no such agreement.

(b) Dependence or independence of McCreary.

The testimony and exhibits have consistently shown that McCreary had some sort of responsibility with respect to the cost, including attorneys' fees, of this litigation. In that respect only, may McCreary be said not to have been completely independent of Firestone, in that Firestone was to bear the bulk of the expenses.

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[5] Since the terms of a "secret" agreement are necessarily not known except to the alleged parties, arguably the agreement could be all-embracive, or limited to a single point. Defendant has not sought to enlighten the court as to what the terms of the supposed secret agreement are.

Other than financial, the record on relationship is as follows:

• • • • • • • • • •

McCreary's conduct in 1966, while it does not prove, is at the very least entirely consistent with, independence of Firestone in the conduct if this litigation, in and since 1961—and the Court finds this to be the fact, except as to McCreary's obligation to pay a share of the litigation expenses.

(c) McCreary's undertaking to pay a share of the litigation expenses.

It has, at least since July 6, 1961, been clear to this Court that some agreement or arrangement existed between Firestone and McCreary pursuant to which McCreary was to bear some portion of the litigation expenses, having relationship to the volume of production of the two companies. The order in which this developed (which is not the chronological order of the events themselves) is as follows:

• • • • • • • • • •

The Court finds as a fact that from March 30, 1961 McCreary was aware that it would be billed for part of the litigation costs; that in fact it has been billed for one percent thereof; that this was a bona fide arrangement, with no agreement that in fact, ultimately, Firestone would bear all the costs or repay to McCreary any payment made by McCreary; and that this arrangement, understood by this Court on December 13, 1965, is consistent with the dictaphone recording of the telephone conversation on May 9, 1961, offered in court on April 26, 1966.

(d) The "secret" agreement.

As previously indicated, the terms of the alleged secret agreement between Firestone and McCreary have not been

developed, and no proffer with respect thereto has been made. The court's finding must therefore necessarily be negative in nature. It is that there is no evidence legally sufficient to prove, or even to justify an inference as to, the existence of a secret or undisclosed agreement between Firestone and McCreary as to the conduct of this litigation, or the payment of the expenses thereof.

3. *Representations as to the effect of the joinder of McCreary.*

There appears to be at least an implication [15] that this court was misled into the belief that the joinder of McCreary might prevent transfer to Cleveland. In fact, plaintiffs' counsel at the July 6, 1961 hearing stated flatly that he did not so contend; that transfer was possible. The court was fully aware of this throughout the case, as indicated in its oral opinion of December 13, 1965 (Transcript, page 26,994).

It has been suggested that the fact that McCreary was an independent party prosecuting the case at its own expense may well have been a determinative factor in the denial of the first motion by defendant to transfer, that is defendant's motion of April 13, 1961 to dismiss or transfer, although the record is clear that the court was fully aware that McCreary's joinder did not prevent transfer (as indicated above) and although the court was fully aware that had Firestone desired to gain a technical advantage, suit could have been brought solely by McCreary with a silent, subsurface undertaking by Firestone com-

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[15] Defendant's Exhibit D to Memorandum in Support of Renewed Motion.

pletely to indemnify and save harmless McCreary.[16] That the court did not consider the fact that McCreary was an independent party prosecuting this case at its own expense a factor, much less a determinative factor, militating against transfer is evidenced by the court's oral opinion of July 6, 1961 denying the first transfer motion and its memorandum of October 14, 1963, denying the second transfer motion, in neither of which is the independence of McCreary, or the sharing of expenses, relied upon as a reason for the denials.

While the court has endeavored to cover the major points, the above memorandum does not purport to be exhaustive. The Court has however carefully considered all the memoranda and exhibits filed by the parties, all transcript references and exhibits to which reference has been made, and the transcript of the oral arguments of counsel, upon the whole of which it makes the following general and ultimate

FINDINGS OF FACT

1. McCreary was an independent party throughout the entire period herein involved and still is an independent party.

2. McCreary agreed to and in fact did bear its proportionate share of the cost of litigation.

3. There is no evidence legally sufficient to prove, or even to justify an inference as to, the existence of a secret

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[16] "When the suit was filed, McCreary was a bona fide customer of Firestone as to oil extended rubber for tread stock and camelback. As such, Firestone could have solicited McCreary to bring the suit as sole plaintiff on an undertaking by Firestone completely to indemnify and save McCreary harmless. A fortiori, the open participation by Firestone and at least partial sharing of costs by McCreary is not improper. See Wheeler v. Denver, 1913, 229 U.S. 342, and see also Schnell v. Eckrich & Sons, 1961, 365 U.S. 260. (Oral opinion of December 13, 1965; Transcript, pages 26,993-26,994).

or undisclosed agreement between Firestone and McCreary as to the conduct of this litigation, or the payment of the expense thereof.

4. The fact that McCreary was an independent party prosecuting the case at its own expense, proportionally, was not a factor, much less a determinative factor, in the denial of the defendant's motion of April 13, 1961 to dismiss or transfer.[17]

5. No fraud, serious or otherwise, has been practiced upon the Court by the plaintiffs.

6. There has been no effort by plaintiffs to practice fraud upon the Court.

CONCLUSIONS OF LAW

1. No fraud has been practiced upon the Court by the plaintiffs.

2. There has been no effort by plaintiffs to practice fraud upon the Court.

3. The renewed motions of April 13, 1961 to dismiss or transfer, of September 6, 1963 to transfer, and the motion for the imposition of sanctions, are each and all without merit, and should be and are denied.

R. DORSEY WATKINS
United States District Judge.

October 17, 1966.

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[17] It is probable that if fraud were in fact intended, it would be immaterial whether or not the court had actually been misled. Hazel Atlas Glass Co. v. Hartford-Empire Co., 1944, 338 U.S. 238, 247; Keystone Driller Co. v. General Excavator Corp., 1933, 290 U.S. 240.

However, because of the language of the Court of Appeals that the alleged false representations "may well have been the determining factor in the denial of the transfer motion" (363 F.2d at page 89) this Court thought it advisable to make Finding 4.

APPENDIX E

Opinion of the United States Court of Appeals for the Fourth Circuit—January 11, 1967 (373 F. 2d 361)*

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* Pertaining to the issue of Firestone's fraud on the courts.

No. 10993.

UNITED STATES COURT OF APPEALS

For the Fourth Circuit.

THE GENERAL TIRE & RUBBER COMPANY,
Petitioner,

vs.

THE HONORABLE R. DORSEY WATKINS, United States District Judge for the District of Maryland,
Respondent.

THE FIRESTONE TIRE & RUBBER COMPANY,
Intervenor.

Before: HAYNSWORTH, *Chief Judge,* and SOBELOFF, BOREMAN, BRYAN, J. SPENCER BELL, WINTER and CRAVEN, *Circuit Judges.*

BY THE COURT:

On April 13, 1961, the petitioner, General Tire and Rubber Company, filed a motion to transfer Civil Action No. 12,932, Firestone Tire & Rubber Co. v. General Tire & Rubber Co., now pending in the District of Maryland, to the United States District Court for the Northern District of Ohio, Eastern Division. On July 6, 1961, the district court denied the motion without prejudice to renew upon subsequent change of conditions. On September 6, 1963, the motion was renewed, and on October 14th of that year the district court again denied the motion. On January 7, 1964, this court declined to issue a writ of mandamus. On June

25, 1966, General again renewed its motion to transfer the case to the Northern District of Ohio or in the alternative to dismiss the action because of an attempt on the part of the plaintiff Firestone Tire and Rubber Company to practice a fraud against the court. General again seeks a mandamus directing the district court either to transfer the case to the Northern District of Ohio or in the alternative to dismiss.

We are unanimously of the opinion that the case should be transferred to the Northern District of Ohio in order to prevent an extravagantly wasteful and useless duplication of the time and effort of the federal courts by the simultaneous trial of two complex and elaborate cases involving substantially the same factual issues.

Our decision of January 1964[1] declining to issue the writ on the grounds that the record at that time did not disclose that the trial court had abused its discretion was premised upon two principal factors: (1) that McCreary Tire and Rubber Company, the customer of Firestone, was an independent coequal party plaintiff against whom alone a patent suit could not be brought in Ohio for reasons of venue, and (2) the plaintiffs and the court confidently predicted that the Maryland case would be reached and disposed of before trial of its sister cases could be started in Ohio. Three years later we again consider the case upon a renewal of the motion to transfer. McCreary is no longer a party, having changed counsel sometime after the death of Mr. McCreary, Sr., and settled with General Tire on July 18, 1966. In a colloquy engaged in by the remaining parties and the court on the record for the information of this court, the plaintiff Firestone and the court "hoped" that the case might be completed by September of 1967, although apparently further depositions to be taken abroad are contemplated. In a suit on the same patent against the United

1. General Tire & Rubber Co. v. Watkins, 4 Cir., 326 F. 2d 926.

States Rubber Company in Ohio pretrial has been completed and that case set to commence on March 1, 1967. We are now faced with the fact that not only has the Maryland case failed promptly to settle the issues between the parties but on the contrary both suits will be in the process of trial simultaneously for at least nine months of the coming year involving the same patent and consequently many common issues of fact and law. A brief history of the action is necessary to understand the issues.

On December 13, 1960, General Tire and Rubber Company filed two separate suits against the Goodyear Tire and Rubber Company and the United States Rubber Company upon Patent No. 2,964,083 in the Northern District of Ohio. These suits were subsequently consolidated. At the same time it wrote Firestone and others offering licenses under the patent.

On March 17, 1961, a meeting was held among counsel for Goodyear, U. S. Rubber and Firestone at which the possibility of a declaratory judgment suit by Firestone was discussed.

On March 30, 1961, a telephone conversation took place between Mr. Irons, counsel for Firestone, and Mr. McCreary, Sr., relating to McCreary's becoming a party plaintiff in the declaratory judgment suit.

On March 30, 1961, the declaratory judgment suit was commenced in Maryland by Firestone Tire and Rubber Company and McCreary Tire and Rubber Company for a declaratory judgment of invalidity and noninfringement of the same patent as that involved in the Ohio suits.

On April 4th and 6th, 1961, General filed suits in Ohio against Firestone and McCreary for infringement of this same patent.

On April 13, 1961, General moved for a transfer of the Maryland suit to Ohio.

On May 9, 1961, a telephone conversation took place between Mr. Birch, counsel for Firestone, and Mr. McCreary, Sr., regarding the billing of McCreary Tire and Rubber for fees and expenses.

On July 6, 1961, the transfer motion of April 13th was heard, and the district court in an oral opinion rendered the same day denied General's motion to transfer without prejudice to renewal upon changed conditions and enjoined General from prosecuting its Ohio cases against the Maryland plaintiffs.

In October 1961 McCreary, Sr., filed answers to interrogatories of General in which he denied that he had any agreement with Firestone concerning the prosecution of this suit, and in August of 1962 Mr. Clark, house patent counsel for Firestone, deposed to the same effect.

On September 6, 1963, General renewed its motion to transfer the case to Ohio, and on October 14, 1963, the court denied this second motion. In its opinion the court said:

> "Further the court is completely unconvinced that a transfer would really conserve judicial manpower. Plaintiffs have consistently stated that if a transfer were made, they would oppose consolidation; they have for the most part, refused to agree that discovery proceedings in the Cleveland cases may be used in this case; and it appears that this case, set firmly for trial on January 7, 1964, in this court will be reached, and (hopefully) will be decided before the Cleveland cases, which may be set for trial in April 1964, if the parties are then ready for trial."

On November 5, 1963, General filed a petition for mandamus to compel the transfer, which this court denied. See note 1 supra.

On April 15, 1964, the Maryland case began trial on a four day per week schedule.

In October 1965, there was disclosed to General a mem-

orandum in the handwriting of Mr. Irons, counsel for Firestone, concerning the meeting on March 17, 1961, with counsel for Goodyear and U. S. Rubber.

On April 18, 1966, there was disclosed to the court and counsel for both sides a transcript of the telephone conversation between Mr. McCreary and Mr. Birch which took place on May 9, 1961. The transcript was found in Mr. McCreary, Sr.'s desk after his death by Mr. Blenko, who had replaced Mr. Irons as counsel for McCreary Tire and Rubber Company.

On June 28, 1966, General again renewed its motion to transfer or in the alternative to dismiss the suit.

On September 26, 1966, the renewed motion was denied, and General again seeks from us a writ of mandamus.

Preliminary to the question of whether or not we should issue the requested writ is the question of whether or not we have jurisdiction to entertain the petition under 28 U. S. C. § 1651(a).[2] We think La Buy v. Howes Leather Co., 352 U. S. 249, 77 S. Ct. 309, 1 L. Ed. 2d 290 (1956), has clearly settled the question of this court's jurisdiction to entertain a petition under the All Writs Statute and to issue the writ under extraordinary circumstances. In *La Buy* the circuit court had issued the writ compelling the trial court to revoke orders of reference to masters in certain antitrust cases. The respondent insisted that the circuit court had no jurisdiction to entertain the petitions because the references would not prevent the appellate court from ultimately reviewing its action on appeal. The Court rejected this argument, saying that the question of the naked power to entertain the writ had long since been settled by the Supreme Court, and adding: "Since the

2. 28 U. S. C. § 1651(a): "The Supreme Court and all courts established by Act of Congress may issue all writs necessary or appropriate in aid of their respective jurisdictions and agreeable to the usages and principles of law."

Court of Appeals could at some stage of the antitrust proceeding entertain appeals in these cases, it has the power in proper circumstances, as here, to issue writs of mandamus reaching them." While this court has been extremely reluctant to exercise its authority,[3] we have not held that the court lacked jurisdiction to entertain the petition, and in United States & Wirtz v. Hemphill, 369 F. 2d 539 (4 Cir. 1966), the writ was issued in a case in which the action of the district court would have ultimately come before this court for review but we felt the issuance of the writ to be the only practical or adequate remedy for an abuse of discretion.[4]

In addition to the usual forum non conveniens arguments which it had offered in support of its motion to transfer General also contends bad faith and fraud on the part of the plaintiffs would justify either transfer or dismissal. It first contends that the Maryland suit was brought by Firestone at the behest of counsel for Goodyear and U. S. Rubber in order to divide the resources and energies of General between Ohio and Maryland and not as a bona fide effort to obtain an expeditious determination in a convenient forum of the rights of the nominal plaintiffs. In support of this contention it offers the memoranda which Mr. Irons, counsel for Firestone, and Mr. Fowler, attorney

3. Cf. General Tire & Rubber Co. v. Watkins, 363 F. 2d 87 (4 Cir. 1966); General Tire & Rubber Co. v. Watkins, 331 F. 2d 192 (4 Cir. 1964); General Tire & Rubber Co. v. Watkins, 326 F. 2d 926 (4 Cir. 1964); Morehead v. Barksdale, 263 F. 2d 117 (4 Cir. 1959); Clayton v. Warlick, 232 F. 2d 699 (4 Cir. 1956); Clinton Foods, Inc. v. United States, 188 F. 2d 289 (4 Cir. 1951).

4. See also Schwab v. Coleman, 145 F. 2d 672, 156 A. L. R. 355 (4 Cir. 1944) (indefinite continuance by district court).

for Goodyear, made at the New York meeting.[5] It also points to the admitted fact that counsel for Goodyear and U. S. Rubber billed their clients for this meeting, although Mr. Clark claims the meeting was called at his behest and

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5. "DEFENDANT'S EXHIBIT 1840

"Mr. Iron's Memorandum of March 17, 1961 Meeting Between Counsel for U. S. Rubber, Firestone and Goodyear.

(Original in longhand)

Mr. Fowler — Cahill, Gordon, Reindel and Ohl
Mr. Correa — March 17, 1961
Mr. Kenyon — 10:30 A.M.
Mr. Mandelbaum
Mr. Clark
Mr. Irons

Mr. Kenyon—Want to start backfire and keep it burning—Where How. If A sues in its name Firestone sued in Cleveland. If Firestone joins w/Armstrong as Plaintiff.—Transfer more probable.

Mr. Correa: Fair chance would happen.

Mr. Kenyon: Problems are
(1) Make case stick
(2) Judge
(3) Cf. 2 Cir.
Discussion of 2 Cir panel
Depends on Panel.

Mr. Clark: Desire to file limited to E. S. I. and S. M. C. at least.

2-3-8

Gates (10). California (9).

While considering, keep mum in re clients *per se.*

Mr. Correa/Mr. Fowler: Good case for Transfer
Query—Check transfer law in 3 Cir. Dist. in Wilmington—Pitt District.

Continued on next Page

Note 5—Continued

Proposed approach to Attorney General to reverse position of Justice Department in respect to whether General Tire patent is within General Tire research contract.

Congress is in Washington.

Mr. Correa favors prompt conference with Justice Department, cf. timing in relation to proposed Firestone Case.

Mr. Correa
Summary—one appeals to Correa is suit on license alone in D. C. Mr. Kenyon concurs.

(Footnote continued on next page.)

for the benefit of Firestone and that counsel for Goodyear and U. S. Rubber were committed not to disclose to their respective clients what was said at the meeting. Secondly, General contends that bad faith was present in the insistence of Firestone and McCreary that McCreary was a wholly independent coequal plaintiff who was free to participate in the action without reference to Firestone's interests. In support of this contention it offers a transcript

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"DEFENDANT'S EXHIBIT 1826

"[Memorandum of March 17, 1961 meeting between U. S. Rubber, Goodyear, and Firestone. The original of this document is in the handwriting of Mr. Fowler, attorney for Goodyear.]

General v. Goodyear

Stan Clark, Irons—
Kenyon, Mandelbaum—
Correa, JAF

Friday, March 17th

1. Armstrong Makes OER & buys it from Firestone—
2. General has given Armstrong notice & offered license—General has sent licenses to 16 or 19 tire companies—So the controversy exists—
3. Armstrong would not sue—Firestone must finance it & be in control—
4. What's the chance of the suit being transferred to Cleveland—
5. 2d (illegible) & 8th Circuits are possibilities—

Mat's suggestion:

1. Firestone file suit in District of Columbia for declaratory judgment on license—No diversity, no Fed. question.
2. General will have to file compulsory counterclaim for patent infringement—
3. Recent decision of Sup Court says suit cannot be transferred under § 1404(a) to a District Court where it could not originally have been brought—
   The original complaint could not have been filed in Fed. Court in Ohio—It is filed in Dist. Court in D. C. as the "municipal" Court—
4. Forum non conveniens—"

of a three way telephone conversation[6] which took place on March 30, 1961, between McCreary, Sr., then President of McCreary; Mr. Clark, house patent counsel for Firestone; and Mr. Irons, counsel for both plaintiffs in this case until sometime after Mr. McCreary, Sr.'s death, and

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6. "DEFENDANT'S EXHIBIT 1836

"[Transcript Made in Mr. Irons' Office of Telephone Conversation with Mr. Harry C. McCreary, Sr.,] 3/30/61

Irons Mr. McCreary, this is Mr. Irons, Hal Birch's partner, down in Washington. Stanley Clark from Firestone is on the other line.

Clark How are you this morning?

Irons We are about to reach a decision about what to do about General and what we would like to do, Mr. McCreary, is file suit in Baltimore using Firestone and McCreary jointly as plaintiffs to attack the General patent and to assert the rights under the government contract with Firestone as nominee. Mr. Beckett talked to you about this. I understand from him that this has been discussed with you and that you have no objection to it. Is that correct?

McCreary That's correct.

Irons Mr. McCreary, the thinking in this direction is that as far as the cost of the litigation is concerned with this office that you would be billed for it, but suppose there is a decision which is adverse. I don't know whether Mr. Beckett covered this with you or not but to the extent that you purchased your oil extended rubber from Firestone, of course Firestone would have to pay on that anyway, but you are not looking for Firestone to hold you harmless in that event with respect to rubber you purchased from them.

Clark I don't think you would go that far. We, of course, are going to fight this thing one way or the other. These people are asking 4¢ a tire; they are asking a little more than that on camelback. It amounts up to the total demand on the whole industry of about $6,000,000.00. You can figure out yourself what the 4¢ a tire will mean to your company. It may not mean as much to you as it does to Firestone.

McCreary I don't know about that. Firestone has lower costs than we have. I try not to worry about that.

Irons All I am saying is this. General has been going after the tire makers, not the rubber manufacturers and so far the rubber manufacturers have not and probably will not extend any immunity with respect to oil extended rubber with this sale to customers. Each tire company has to go ahead and take his own risk with respect to his patent. You run some risks in

(Footnote continued on next page.)

particularly the transcript of a telephone conversation between Mr. McCreary, Sr. and Mr. Harold Birch, a partner to Mr. Irons, which took place on May 9, 1961.[7]

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going into this suit. If we lose, you lose with us. You understand that?

McCreary Certainly. Certainly. If you fight without us and you lose, then I lose.

Clark If we sit back and don't do anything, we have lost just as surely as we sit here.

McCreary I would be glad to join with you and also do anything here I can.

Clark Wonderful. If we win, both of us are in free.

McCreary Well that I appreciate and I will try to show my appreciation by being just as active in this thing as I think you want us to be.

Irons We don't make many demands on you but there were to be—

McCreary We'll take care of our own travel bills and stuff like that.

Irons Hal Birch sends his regards to you Mr. McCreary.

McCreary Thank you and send mine to him. You will probably want some signatures.

Irons We may on some affidavits and any papers that will be of interest to you.

McCreary Keep us posted and we'll be guided by your office 100%."

7. The following is a transcript of the pertinent part of the telephone conversation:

"Voice No. 1: Hello, hello.
Voice No. 2: Hello, hello, sir.
Voice No. 1: Hello.
Voice No. 2: Can you hear me?
Voice No. 1: Yes.
Voice No. 2: Just a moment for Mr. Birch in Washington.
Voice No. 1: Right.
Voice No. 3: Hello.
Voice No. 1: Hello.
Voice No. 3: Hal Birch, Mr. McCreary.
Voice No. 1: Yes.
Voice No. 3: How are you up in Indiana?
Voice No. 1: First class.
Voice No. 3: Why, we've been going around and around and around with General, as you know, and we've got a little bit of a problem. There is a bit of a schism in their approach to McCreary as against Firestone, and we think they're probably trying to line up to say in the long run that McCreary can be transferred out because they are just Firestone's little patsy, and Firestone is paying the whole bill.

(Footnote continued on next page.)

In short General contends that the memorandum of Mr. Irons on the March 17, 1961, meeting discloses that Firestone was asked to start a "backfire" by U. S. Rubber for the purpose of delaying and disrupting the Ohio litigation; that this case was brought 3 days after such request;

Now, here is what we'd like to do, if it's all right with you, with full recognition that the agreement that was made between you and Stanley Clark is not going to, in the long run, change one tiny little bit. I don't want to put anything in the mail, and I don't want to talk about it too much, for obvious reasons.

Voice No. 1: Right.

Voice No. 3: What we would like to do is this: The relative production as between you and Firestone is about 99 to 1.

Voice No. 1: That sounds about right.

Voice No. 3: In other words, you are 1 per cent of their total business, tire business.

Voice No. 1: Right.

Voice No. 3: So what we would like to do would be to formally bill you folks for 1 per cent of the cost of this litigation, which this last month, would add up to the tremendous figure of $34.86.

Voice No. 1: I believe we could stand that.

Voice No. 3: If you could stand that—

Voice No. 1: I think s—

Voice No. 3: Well, that's about what it'll be monthly, and then if you could send us that amount of money just as if we were—

Voice No. 1: Right.

Voice No. 3: —Firestone didn't even exist.

Voice No. 1: Right.

Voice No. 3: Bearing in mind that—

Voice No. 1: Right.

Voice No. 3: —after this is all over with, why, everything will come out in the wash.

Voice No. 1: That's right.

Voice No. 3: Okay?

Voice No. 1: That's perfectly all right.

Voice No. 3: All right. Well, we didn't think you would have any serious—

Voice No. 1: Not at all, and I certainly don't want them to be able to split this thing apart.

Voice No. 3: Well, that is right, because what they have now done, I don't know whether Ed has talked to you about this recently, but what they have now done is move in Ohio to enjoin Firestone from proceeding in the Maryland lawsuit. Well, of course, we have already moved in Maryland to enjoin them from proceeding against Firestone in any other court.

Voice No. 1: Uh hum.

(Footnote continued on next page.)

that the parties recognized the possibility of a transfer to Ohio, and to prevent it McCreary was brought in as a co-plaintiff and represented to be an independent party while in fact there was a secret agreement that Firestone through joint counsel would completely dominate and control this case.

In a long and meticulous memorandum opinion filed by the court on October 17, 1966, the court reviewed the evidence concerning General's charges and found with Firestone on all points. It found that the New York conference was held at the request of Firestone's counsel; that Firestone did not start the Maryland suit as a "backfire"; that McCreary was not decided on as a party plaintiff until the day the complaint was filed, and that it was completely independent and chose the forum for its own convenience and because of its commercial activity in Baltimore. It further found that McCreary's agreement to pay one per cent of the expenses and attorneys' fees was a bona fide agreement and the only agreement between the plaintiffs with respect to the lawsuit, and that there was no agreement that Firestone would ultimately repay McCreary. The court thereupon denied the motion to transfer on the

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Voice No. 3: So this is—ah—in two courts now, and real interesting, but they did not move to enjoin McCreary.
Voice No. 1: Uh huh.
Voice No. 3: See?
Voice No. 1: Uh huh.
Voice No. 3: So we don't want to leave any stone unturned in case they should file an interrogatory and ask McCreary if they are paying their toll in this lawsuit.
Voice No. 1: I certainly—
Voice No. 3: Whatsoever.
Voice No. 1: I certainly want to be able to prove it.
Voice No. 3: Right. So what we want to do is to send you—and we'll send you a bill for both March and April.
Voice No. 1: Fair enough.
Voice No. 3: The March bill will be even smaller than the $34.00.
Voice No. 1: Well, that's quite all right.
Voice No. 3: (Laughter) Okay."

grounds that there was no attempt to practice fraud on the court and that in any event the court was not deceived about McCreary's relationship to its co-plaintiff.

We do not feel it advisable at this stage in the lawsuit to pass on the district court's findings and conclusions with respect to General's contentions of bad faith and misrepresentation to the court. Without denigrating the importance of these issues in the ultimate assessment of costs between the parties, we think that their resolution in favor of Firestone should not have been determinative of the motion to transfer. Indeed we think the court's preoccupation therewith caused it to overlook completely the factor which should have controlled the decision. That factor was the complete change of conditions which had taken place since the motion was originally denied. This failure resulted in an order which constituted an abuse of discretion.[8]

That conditions had changed is evident upon examination of the reason set forth in the judge's memorandum opinion filed on October 14, 1963, denying both the original motion and its renewal, i. e., that the Maryland case would be reached and tried before the Ohio case could be started. Furthermore, although the court concluded on October 14, 1963, and again on September 24, 1966, that its original denial of the transfer motion was not influenced by McCreary's presence as a party plaintiff, we think the subsequent settlement with McCreary on July 18, 1966, further strengthens the case for transfer at this time.

We turn now to our reasons for issuing the writ under the extraordinary circumstances of this case. We think the district court erred in its failure to weigh the impelling

8. For an interesting discussion of the criteria which should determine the exercise of discretion to issue the extraordinary writ see: Mandamus Proceedings in the Federal Courts of Appeals: A Compromise With Finality, 52 Calif. L. R. 1036.

need for efficiency in the administration of our court system against the right of Firestone to continue the trial in a forum which no longer offered to it any convenience over the Ohio forum. Certainly the simultaneous trial of two suits in different circuits involving a number of identical questions of fact and law would result in a useless waste of judicial time and energy. Against the judicial time and effort already spent on the Maryland case must be weighed the fact that the Ohio judge either has been, or will have to be, "educated" in much of the same factual background whether or not the Ohio case against Firestone can be consolidated with its companion case against U. S. Rubber.

The United States Supreme Court considered the question of multiple litigation in the federal courts in Kerotest Mfg. Co. v. C-O-Two Co., 342 U. S. 180, 72 S. Ct. 219, 96 L. Ed. 200 (1952). In that case C-O-Two, owner of two patents, brought an infringement action in Illinois against a customer of Kerotest, manufacturer of the allegedly infringing item. Kerotest subsequently brought a declaratory judgment action on the same patents in Delaware. Later Kerotest was joined as a party defendant in the Illinois action. The Delaware district court stayed the Illinois suit as against Kerotest on the ground that the Delaware action had commenced before Kerotest became a party to the Illinois suit. The Third Circuit reversed, ordering the district court to stay its proceedings in the case until 10 days after final determination of the Illinois litigation. The Third Circuit refused to rest its decision upon so artificial a test as the chronology of the suits, but rather considered the test to be "whether the relief sought can be 'more expeditiously and effectively afforded [in the other suit] than in the declaratory proceeding'." The Supreme Court, in affirming the Third Circuit, said:

> "The Federal Declaratory Judgments Act, facilitating as it does the initiation of litigation by different

parties to many-sided transactions, has created complicated problems for co-ordinate courts. Wise judicial administration, giving regard to conservation of judicial resources and comprehensive disposition of litigation, does not counsel rigid mechanical solution of such problems. The factors relevant to wise administration here are equitable in nature. Necessarily, an ample degree of discretion, appropriate for disciplined and experienced judges, must be left to the lower courts." 342 U. S. at 184, 72 S. Ct. at 221.

The Court also noted that "[t]he manufacturer who is charged with infringing a patent cannot stretch the Federal Declaratory Judgments Act to give him a paramount right to choose the forum for trying out questions of infringement and validity." Id. at 185, 72 S. Ct. at 222.

The Second Circuit, in Hammett v. Warner Bros. Pictures, Inc., 176 F. 2d 145 (2 Cir. 1949), stressed the expediency of avoiding multiple trials involving common issues. In that case, the issue was who owned rights to the character "Sam Spade," with Warner Bros. claiming rights under its copyright on *The Maltese Falcon,* and Hammett, the original creator of the character, claiming Warner's copyright covered only that book and not the character as it may appear in other books and stories. Warner Bros. commenced a suit in California, while Hammett brought a declaratory judgment action in New York. The Second Circuit affirmed the district court's dismissal of the New York action on grounds that all issues would be resolved in California. See also Alamance Industries, Inc. v. Filene's, 291 F. 2d 142 (1 Cir. 1961).

Our situation is factually different from both *Kerotest* and *Hammett* because the suit which is set to be tried in Ohio in March is against U. S. Rubber and not Firestone. Presumably General's Ohio suit against Firestone was not consolidated with the suits against Goodyear and U. S. Rubber because the Maryland district court had enjoined

General from prosecuting its Ohio suit. This difference necessitates our invoking a different remedy, but the principle to be applied is the same: maintenance of judicial economy. The prompt transfer of the Maryland suit to Ohio will make it available there for consolidation and trial in March with the suit against U. S. Rubber. In view of the complex and time consuming nature of patent cases, the advisability of consolidation is obvious. See Pharma-Craft Corp. v. F. W. Woolworth Co., 144 F. Supp. 298 (M. D. Ga. 1956). The district court, in its denial of General's second transfer motion, pointed out that Firestone had expressed a determination to fight consolidation if the case were transferred. While we suspect that Firestone might have a change of heart after transfer, in any event, its opposition would not be determinative of the issue. See American Photocopy Equip. Co. v. The Fair, 35 F. R. D. 236 (N. D. Ill. 1963). This record discloses no reason why consolidation should not be as feasible here as in the two other cases.

Since General's Ohio case against U. S. Rubber cannot be moved to Maryland and consolidated for trial with the pending declaratory judgment suit, we think the district court abused its discretion in not transferring the Maryland case to Ohio where it will be available for consolidation —the only way in which time and effort can now be saved. The traditional forum non conveniens argument is no longer available. Both parties are Ohio corporations with their main offices in that state. It is the center of rubber manufacture in the United States, and many if not most of the documents and witnesses are there. Firestone has made no serious argument to the contrary. The evidence indicates a high degree of forum shopping which we recognize as an inevitable adjunct to the congressional policy on declaratory judgment suits in patent litigation, but forum shopping must not be indulged in the face of mutiple litiga-

tion especially where, as here, the shopper is offered an equally convenient forum. See Caldwell Mfg. Co. v. Unique Balance Co., 18 F. R. D. 258 (S. D. N. Y. 1955).

We are aware of the distinction made by some courts of appeal between entertaining a writ of mandamus from an order of a district court denying transfer under 28 U. S. C. § 1404(a) and entertaining a writ when the district court granted transfer. E. g., In re Josephson, 218 F. 2d 174 (1 Cir. 1954). See LaBuy v. Howes Leather Co., 352 U. S. 249, 260, 77 S. Ct. 309, 1 L. Ed. 2d 290 (1957) (Justice Brennan dissenting). The reasoning is that extraordinary writs authorized under 28 U. S. C. § 1651 are to be issued only in aid of appellate jurisdiction, and since denying transfer does not deprive the appellate court of ultimate jurisdiction to hear the issue on appeal, issuance of the writ in such a situation in not properly in aid of the court's jurisdiction. On the other hand, if the district court transfers the case out of the circuit, the court of appeals is being deprived of its ultimate jurisdiction to review and, therefore, mandamus is deemed justifiable.

While the rationale of In re *Josephson* has merit where the issue before the court is whether the district court has abused its discretion in circumvention of the rights of the parties, we find it inappropriate in our situation. We are not concerned here only with the rights of private litigants which we feel in any event will not be impaired in the least by transfer.[9] Nor are we concerned only with the problem of whether or not we shall ultimately lose our

9. We agree with the statement of Judge Learned Hand in Magnetic Engineering & Mfg. Co. v. Dings Mfg. Co., 178 F. 2d 866, 869 (2 Cir. 1950): "We do not believe that our power to protect our own jurisdiction extends to protecting it as against the jurisdiction of another federal court of equal jurisdiction, or that a suitor has any legally protected interest in having his action tried in any particular federal court, except insofar as the transfer may handicap his presentation of the case, or add to the costs of trial."

jurisdiction to review to another appellate court. Rather, our interest is with effective administration and supervision of the courts of our circuit. It is obvious that if we postpone action until appeal after final judgment, the question will have become moot and the damage done. We do not believe that the rule developed in those cases was intended to prevent our acting in this extraordinary situation.

We are not here permitting use of mandamus as a substitute for interlocutory appeal, which is, with a few statutory exceptions, prohibited in the federal courts. See 28 U. S. C. §§ 1291-92. Rather, we are using the writ for a purpose for which we think it was intended—to correct a wrong to the court which otherwise can never be effectively presented on appeal. The order of the district court is reversed; the writ will be issued.

An appropriate order will be entered.

APPENDIX F

The "Rubber Act of 1948" and the "Rubber Producing Facilities Disposal Act of 1953" (50 U. S. C. A. App. § 1921, et seq. and 50 U. S. C. A. App. § 1941, et seq., Respectively).

DOMESTIC RUBBER-PRODUCING INDUSTRY

ACT MAR. 31, 1948, C. 166, 62 STAT. 101

§ 1921. Congressional Declaration of Policy

It is the policy of the United States that there shall be maintained at all times in the interest of the national security and common defense, in addition to stock piles of natural rubber which are to be acquired, rotated, and retained pursuant to the Strategic and Critical Materials Stock Piling Act (Public Law 520, Seventy-ninth Congress, approved July 23, 1946) [sections 98-98h of this title], a technologically advanced and rapidly expandible rubber-producing industry in the United States of sufficient productive capacity to assure the availability in times of national emergency of adequate supplies of synthetic rubber to meet the essential civilian, military, and naval needs of the country. It is further declared to be the policy of the Congress that the security interests of the United States can and will best be served by the development within the United States of a free, competitive synthetic-rubber industry. In order to strengthen national security through a sound industry it is essential that Government ownership of production facilities, Government production of synthetic rubber, regulations requiring mandatory use of synthetic rubber, and patent pooling be ended and terminated whenever consistent with national security, as provided in this Act [sections 1921-1938 of this Appendix]. Mar. 31, 1948, c. 166, § 2, 62 Stat. 102.

§ 1922. Authorization of Certain Controls Over Natural and Synthetic Rubber and Rubber Products

To effectuate the policies set forth in section 2 of this Act [section 1921 of this Appendix], the President is authorized to exercise allocation, specification, and inventory controls of nat-

ural rubber and synthetic rubber, and specification controls of products containing natural rubber and synthetic rubber, notwithstanding any changes in the supply or estimated supply of natural rubber or synthetic rubber; and he shall exercise such controls by issuing such regulations as are required to insure (a) the consumption in the United States of general-purpose synthetic rubber in a specified percentage of the combined total estimated annual consumption of natural rubber and general-purpose synthetic rubber consumed within the United States, and (b) the consumption in the United States of any or all types of special-purpose synthetic rubber in specified percentages of the combined total estimated annual consumption of natural rubber, general-purpose synthetic rubber, and special-purpose synthetic rubber consumed within the United States. Such percentages shall be established so as to assure the production and consumption of general-purpose synthetic rubber and special-purpose synthetic rubber in quantities determined by the President to be necessary to carry out the policy of section 2 of this Act [section 1921 of this Appendix], and the provisions of Public Law 520, Seventy-ninth Congress, approved July 23, 1946 [sections 98-98h of this title]: *Provided*, That the minimum percentages established by the President shall result in a total annual tonnage consumption of synthetic rubber of at least the amount specified in section 5(d) of this Act [section 1924(d) of this Appendix], and that any mandatory consumption in excess of the quantities specified in section 5(d) of this Act [section 1924(d) of this Appendix] shall not be more than is deemed by the President to be necessary in the interest of national security and the common defense. Mar. 31, 1948, c. 166, § 3, 62 Stat. 102.

§ 1923. Importation and Exportation

(a) The President may impose such import restrictions on finished and semifinished rubber products as he deems necessary to assure equality with like or similar products produced within

the United States in accordance with regulations issued under this Act [sections 1921-1938 of this Appendix].

(b) The President may exempt from the regulations issued under this Act [sections 1921-1938 of this Appendix] finished and semifinished rubber products manufactured in the United States exclusively for export outside the United States. Mar. 31, 1948, c. 166, § 4, 62 Stat. 102.

§ 1924. Domestic Rubber-Producing Capacity

(a) There shall be maintained at all times within the United States rubber-producing facilities having a rated production capacity of not less than six hundred thousand long tons per annum of general-purpose synthetic rubber and not less than sixty-five thousand long tons per annum of special-purpose synthetic rubber.

(b) Of the sixty-five-thousand-long-ton rated production capacity for special-purpose synthetic rubber, specified in section 5(a) of this Act [subsection (a) of this section], at least forty-five thousand long tons shall be of a type suitable for use in pneumatic inner tubes.

(c) The synthetic rubber used to satisfy the mandatory consumption provided in section 3 of this Act [section 1922 of this Appendix] shall be produced by the Government or for the Government account, or purchased from others for resale by the Government or for the Government account.

(d) Facilities in operation by the Government or private persons shall produce annually not less than one-third of the rated production capacities specified in section 5(a) and (b) of this Act [subsections (a) and (b) of this section].

(e) The facilities to be maintained in operation by the Government and those to be maintained in adequate stand-by-condition shall be determined from time to time by the President.

(f) At least one facility for making butadien from alcohol shall be maintained in operation or in adequate stand-by condition. Mar. 31, 1948, c. 166, § 5, 62 Stat. 103.

§ 1925. Research and Development

(a) To effectuate further the policies set forth in section 2 of this Act [section 1921 of this Appendix] with respect to a technologically advanced domestic rubber-producing industry, continuous and extensive research by private parties and the Government is essential. The Government is authorized to undertake research in rubber and allied fields and the powers, functions, duties, and authority of the Government to undertake research and development in rubber and allied fields shall be exercised and performed by such departments, agencies, officers, Government corporations, or instrumentalities of the United States as the President may designate, whether or not existing at the date of enactment of this Act [March 31, 1948].

(b) The cost of undertaking and maintaining the research and development authorized in secton 6(a) of this Act [subsection (a) of this section] may be paid from such sums as the Congress, from time to time, may appropriate to carry out the provisions of this Act [sections 1921-1938 of this Appendix]. Mar. 31, 1948, c. 166, § 6, 62 Stat. 103.

§ 1926. Operation of Rubber-Producing Facilities by the Government—(a) Designation of Authority to Operate

The powers, functions, duties, and authority to produce and sell synthetic rubber conferred in section 7(b) of this Act [subsection (b) of this section] shall be exercised and performed by such department, agency, officer, Government corporation, or instrumentality of the United States as the President may designate, whether or not existing at the date of enactment of this Act [March 31, 1948].

Production and Sale of Synthetic Rubber

(b) The department, agency, officer, Government corporation, or instrumentality of the United States designated by the President pursuant to section 7(a) of this Act [subsection (a) of this section] shall have the powers, functions, duties, and authority to produce and sell synthetic rubber, including the component materials thereof, in amounts sufficient to assure the production of synthetic rubber as required by the President in section 3 of this Act [section1922 of this Appendix]: *Provided*, That so far as practicable the President shall authorize such production of synthetic rubber, including the component materials thereof, as may be necessary to satisfy voluntary usage of synthetic rubber, including the component materials thereof.

Extent of Authority

(c) The aforesaid powers, functions, duties, and authority to produce and sell include all power and authority in such department, agency, officer, Government corporation, or instrumentality of the United States to do all things necessary and proper in connection with and related to such production and sale, including but not limited to the power and authority to make repairs, replacements, alterations, improvements, or betterments to the rubber-producing facilities owned by the Government or in connection with the operation thereof and to make capital expenditures as may be necessary for the efficient and proper operation and maintenance of the rubber-producing facilities owned by the Government and performance of said powers, functions, duties, and authority.

Lease for Operation for Government Account; Lease for Private Purposes

(d) Notwithstanding the provisions of this or any other Act, the aforesaid powers, functions, duties, and authority to produce and sell include the power and authority in such department,

agency, officer, Government corporation, or instrumentality of the United States to (1) lease for operation for Government account all or any part of the Government-owned rubber-producing facilities in connection with the performance of said powers, functions, duties, and authority to produce and sell; (2) lease, for a period not extending beyond the termination date of this Act [June 30, 1950], Government-owned rubber-producing facilities for private purposes if such lease contains adequate provisions for the recapture thereof for the purposes set forth in section 7(b) of this Act [subsection (b) of this section] and if such lease provides that any synthetic rubber or component material as may be produced by the leased facilities shall not be used to satisfy mandatory requirements established by section 3 [section 1922 of this Appendix]; (3) grant permanent easements or licenses for private purposes in, on, or over land comprising part of the Government-owned rubber-producing facilities if such grant provides that such easement or license shall not interfere with the use at any time of the rubber-producing facilities involved; and (4) sell or otherwise dispose of obsolete or other property not necessary for the production of the rated capacity of the particular plant to which such property is charged. Mar. 31, 1948, c. 166, § 7, 62 Stat. 103.

§ 1927. Stand-by Facilities; Maintenance

(a) To effectuate further the policies set forth in section 2 of this Act [section 1921 of this Appendix], the President is authorized to place in adequate stand-by condition such rubber-producing facilities as he shall determine necessary to maintain the continued existence of rubber-producing facilities capable of producing the tonnage of synthetic rubber required by section 5(a) of this Act [section 1924(a) of this Appendix].

(b) Rubber-producing facilities placed in stand-by condition by the President pursuant to section 8(a) of this Act [subsection (a) of this section] may be maintained by such department, agency, officer, Government corporation, or instrumentality of

the United States, whether or not existing on the date of enactment of this Act, as the President may designate: *Provided*, That nothing contained in section 8(b) of this Act [this subsection] shall preclude such department, agency, officer, Government corporation, or instrumentality of the United States from entering into contracts with private persons for the maintenance of stand-by facilities: *Provided further*, That the cost of placing facilities in stand-by condition, maintaining such facilities in adequate stand-by condition, and, when necessary, reactivating such facilities, may be paid from such sums as the Congress, from time to time, may appropriate to carry out the provisions of this Act [sections 1921-1938 of this Appendix]. Mar. 31, 1948, c. 166, § 8, 62 Stat. 104.

§ 1928. Disposal of Government-Owned Rubber-Producing Facilities

(a) The department, agency, officer, Government corporation, or instrumentality of the United States designated by the President pursuant to section 7(a) of this Act [section 1926(a) of Appendix] shall undertake immediate study, conducting such hearings as may be necessary, in order to determine and formulate a program for disposal to private industry by sale or lease of the Government-owned rubber-producing facilities other than those authorized to be disposed of pursuant to section 9(b) of this Act [subsection (b) of this section]. A report with respect to the development of such a disposal program shall be made to the President and to Congress not later than April 1, 1951. On or before January 15, 1952, the President, after consultation with the National Security Resources Board, shall recommend to the Congress legislation with respect to the disposal of the Government-owned rubber-producing facilities other than those authorized to be sold, leased, or otherwise disposed of under the provisions of section 9(b) of this Act [subsection (b) of this section], together with such other recommendations as he deems desirable and appropriate: *Provided*, That the Govern-

ment shall maintain the ownership of a rated rubber-producing capacity of six hundred thousand long tons of general-purpose rubber and a rated rubber-producing capacity of sixty-five thousand long tons of special-purpose rubber until a program is formulated and adopted for the sale or lease of such facilities as provided in this section.

(b) Notwithstanding the provisions of this or any other Act, the department, agency, officer, Government corporation, or instrumentality of the United States designated by the President pursuant to section 7(a) of this Act [section 1926(a) of this Appendix] may, after consultation with the National Security Resources Board, sell, lease, or otherwise dispose of to private persons any rubber-producing facility, including such facilities as have been declared surplus pursunt to the Surplus Property Act of 1944, as amended, not required to fulfill the capacity set forth in section 5(a) of this Act [section 1924(a) of this Appendix] upon such terms and conditions as it may determine providing that such sale or lease shall be on the condition that any synthetic rubber or component materials produced in such facility shall not be used to satisfy the mandatory requirements established by section 3 of this Act [section 1924(a) of this Appendix]. Mar. 31, 1948, c. 166, § 9, 62 Stat. 105; June 24, 1950, c. 357, § 1(a), 64 Stat. 256.

§ 1929. Administration—(a) Rules and Regulations

The President may issue such rules and regulations as he deems necessary and appropriate to carry out the provisions of this Act [sections 1921-1938 of this Appendix].

Delegation of Powers and Duties by President

(b) The President may exercise any or all of the powers, authority, and discretion conferred upon him by this Act [sections 1921-1938 of this Appendix], including but not limited to the powers and authority conferred in section 12 of this Act

[section 1931 of this Appendix], through such departments, agencies, officers, Government corporations, or instrumentalities of the United States, whether or not existing at the date of the enactment of this Act [March 31, 1948], as he may direct.

Consolidation of Powers and Functions; Creation of Corporation; Powers; Subscription to Capital Stock

(c) The President, insofar as practical, shall consolidate all of the powers, functions, and authority contained in this Act [sections 1921-1938 of this Appendix] in one department, agency, officer, Government corporation, or instrumentality of the United States, whether or not existing at the date of enactment of this Act [March 31, 1948]. The President is authorized to cause a corporation to be organized for the purpose of producing and selling synthetic rubber. Any such corporation so organized shall be authorized, subject to the Government Corporation Control Act [sections 841-869 of Title 31] and to pertinent provisions of law affecting Government corporations, to sue and be sued, to acquire, hold, and dispose of property, to use its revenues, to determine the character of and necessity for its obligations and expenditures and the manner in which they shall be incurred, allowed and paid, and to exercise such other powers as may be necessary or appropriate to carry out the purposes of the corporation. The Secretary of the Treasury is authorized, out of appropriations made for that purpose, to subscribe to the capital stock of such corporation.

Transfer of Facilities, Personnel, Funds, Etc.

(d) The President may transfer to the departments, agencies, officers, Government corporations, or instrumentalities of the United States, or to any of them, which he directs to exercise the powers, authority, and discretion conferred upon him by this Act [sections 1921-1938 of this Appendix], such rubber-producing facilities, personnel, property, and records relating to such powers, authority, and discretion, as he deems neces-

sary; and he may so transfer all appropriations or other funds available for carrying out such powers, authority, and discretion.

Annual Report

(e) In addition to the reports required by section 9(a) of this Act [section 1928(a) of this Appendix], each department, agency, officer, Government corporation, or instrumentality of the United States to whom the President may delegate any powers, authority, and discretion conferred by this Act [sections 1921-1938 of this Appendix] shall make an annual report to the President and to the Congress of operations under this Act [sections 1921-1938 of this Appendix]. Mar. 31, 1948, c. 166, § 10, 62 Stat. 1929.

§ 1930. Patent Pooling and Use of Technical Information

(a) To effectuate further the policies of this Act [sections 1921-1938 of this Appendix], the President is authorized and directed to take such action as may be appropriate with respect to patent pooling, patent licensing and exchange of information agreements entered into with the Government as a part of the wartime synthetic rubber program and, insofar as practicable and consistent with the purposes of this Act [sections 1921-1938 of this Appendix], to effectuate immediate cessation of further accumulation of technical information or rights to patents under the agreement dated December 19, 1941, as supplemented June 12, 1942, between the Government and others.

(b) Any department, agency, officer, Government corporation, or instrumentality of the United States as the President may designate to perform the powers, functions, duties, and authority referred to in section 7(b) of this Act [section 1926(b) of this Appendix] shall be entitled to the benefits of the Act of June 25, 1910 (36 Stat. 851), as amended July 1, 1918 (40 Stat. 705) [section 68 of Title 35], or any similar Act. Mar. 31, 1948, c. 166, § 11, 62 Stat. 106.

§ 1931. Information, Records, Etc., for Enforcement or Administrative Purposes; Oaths, Affidavits, Subpenas, Etc.; Witnesses; Testimony; Publication of Information; Penalties

(a) The President shall be entitled to obtain such information from, require such reports and the keeping of such records by, make such inspection of the books, records, and other writings, premises, or property of, any person and make such investigations, as may be necessary or appropriate, in his discretion, to the enforcement or administration of the provisions of this Act [sections 1921-1938 of this Appendix].

(b) For the purpose of obtaining any information, verifying any report required, or making any investigation pursuant to section 12(a) of this Act [subsection (a) of this section], the President may administer oaths and affirmations, and may require by subpena or otherwise the attendance and testimony of witnesses and the production of any books or records or any other documentary or physical evidence which may be relevant to the inquiry. Such attendance and testimony of witnesses and the production of such books, records, or other documentary or physical evidence may be required at any designated place from any State, Territory, or other place subject to the jurisdiction of the United States: *Provided,* That the production of a person's books, records, or other documentary evidence shall not be required at any place other than the place where such person resides or transacts business, if, prior to the return date specified in the subpena issued with respect thereto, such person furnishes the President with a true copy of such books, records, or other documentary evidence (certified by such person under oath to be a true and correct copy) or enters into a stipulation with the President as to the information contained in such books, records, or other documentary evidence. Witnesses shall be paid the same fees and mileage that are paid witnesses in the courts of the United States. No person shall be excused

from attending and testifying or from producing any books, records, or other documentary evidence or certified copies thereof, or physical evidence, in obedience to any such subpena, or in any action or proceeding which may be instituted under this Act [sections 1921-1938 of this Appendix] on the ground that the testimony or evidence, documentary or otherwise, required of him may tend to incriminate him or subject him to a penalty or forfeiture; but no individual shall be subject to prosecution and punishment, or to any penalty or forfeiture, for or on account of any transaction, matter, or thing concerning which he is compelled to testify or produce evidence, documentary or otherwise, after having claimed his privilege against self-incrimination, except that any such individual so testifying shall not be exempt from prosecution and punishment for perjury committed in so testifying. The President shall not publish or disclose any information obtained under this section which the President deems confidential or with reference to which a request for confidential treatment is made by the person furnishing such information, unless the president determines that the withholding thereof is contrary to the interest of the national defense and security; and anyone violating this provision shall be guilty of a felony and, upon conviction thereof, shall be fined not exceeding $1,000 or be imprisoned not exceeding two years, or both. Mar. 31, 1948, c. 166, § 12, 62 Stat. 106.

§ 1932. Penalties

Any person who willfully performs any act prohibited, or willfully fails to perform any act required by any provision of this Act [sections 1921-1938 of this Appendix] or any rule, regulation, or order thereunder, shall upon conviction be fined not more than $10,000 or imprisoned for not more than two years, or both. Mar. 31, 1948, c. 166, § 13, 62 Stat. 107.

§ 1933. Jurisdiction of Courts; Venue; Process; Costs

(a) The district courts of the United States, and the United States courts of any Territory or other place subject to the jurisdiction of the United States, shall have jurisdiction of violations of this Act [sections 1921-1938 of this Appendix] or any rule, regulation, or order or subpena thereunder, and of all civil actions under this Act [said sections] to enforce any liability or duty created by, or to enjoin any violation of this Act [said sections] or any rule, regulation, order, or subpena thereunder.

(b) Any criminal proceeding on account of any such violation may be brought in any district in which any act, failure to act, or transaction constituting the alleged violation occurred. Any such civil action may be brought in any such district or in the district in which the defendant resides or transacts business. Process in such cases, criminal or civil, may be served in any district wherein the defendant resides or transacts business or wherever the defendant may be found; and subpenas for witnesses who are required to attend a court in any district in any such cases may run into any other district. No costs shall be assessed against the United States in any proceeding under this Act [sections 1921-1938 of this Appendix]. Mar. 31, 1948, c. 166, § 14, 62 Stat. 107.

§ 1934. Exculpatory Clause

No person shall be held liable for damages or penalties for any default under any contract or order which shall result directly or indirectly from compliance with this Act [sections 1921-1938 of this Appendix] or any rule, regulation, or order issued thereunder, notwithstanding that any such rule, regulation, or order shall thereafter be declared by judicial or other competent authority to be invalid. Mar. 31, 1948, c. 166, § 15, 62 Stat. 107.

§ 1935. Exemption from Administrative Procedure Act

Functions exercised under this Act [sections 1921-1938 of this Appendix] shall be excluded from the operation of the Administrative Procedure Act [sections 1001-1011 of Title 5] except as to the requirements of sections 3 and 10 thereof [sections 1002 and 1009 of Title 5]. Mar. 31, 1948, c. 166, § 16, 62 Stat. 108.

§ 1936. Definitions

For the purposes of this Act [sections 1921-1938 of this Appendix]—

(a) The term "natural rubber" means all forms and types of tree, vine, or shrub rubber, including guayule and natural rubber latex, but excluding reclaimed natural rubber;

(b) The term "synthetic rubber" means any product of chemical synthesis similar in general properties and applications to natural rubber, and specifically capable of vulcanization, produced in the United States, not including reclaimed synthetic rubber;

(c) The term "general-purpose synthetic rubber" means a synthetic rubber of the butadiene-styrene type generally suitable for use in the manufacture of transportation items such as tires or camel-back, as well as any other type of synthetic rubber equally or better suited for use in the manufacture of transportation items such as tires or camel-back as determined from time to time by the President;

(d) The term "special-purpose synthetic rubber" means a synthetic rubber of the types now known as butyl, neoprene, or N-types (butadiene-acrylonitrile types) as well as any synthetic rubber of similar or improved quality applicable to similar uses, as determined from time to time by the President;

(e) The term "rubber-producing facilities" means facilities, in whole or in part, for the manufacture of synthetic rubber,

and the component materials thereof, including, but not limited to, buildings and land in which or on which such facilities may be located and all machinery and utilities associated therewith;

(f) The term "rated production capacity" means the actual productive capacity assigned to any rubber-producing facilities at time of authorization of construction or as thereafter amended in authorizations of additional construction or alterations thereto and used in published reports and in the records of the Office of Rubber Reserve, Reconstruction Finance Corporation, or successor agency, or privately owned plants, determined by the President based upon operating experience and records as determined from time to time by the President;

(g) The term "component materials" means the material, raw, semi-finished, and finished, necessary for the manufacture of synthetic rubber;

(h) The term "stand-by condition" means the condition in which rubber-producing facilities, in whole or in part, are placed when determined to be not needed for current operations, but are maintained so as to be readily available for the production of synthetic rubber or component materials;

(i) The term "person" means any individual, firm, copartnership, business trust, corporation, or any organized group of persons whether incorporated or not, and except for the provisions of section 13 [section 1932 of this Appendix] any Government department, agency, officer, corporation, or instrumentality of the United States; and

(j) The term "United States" includes the several States, the District of Columbia; the Territories of Alaska and Hawaii, and Puerto Rico. Mar. 31, 1948, c. 166, § 18, 62 Stat. 1936.

§ 1937. Appropriations

(a) There are authorized to be appropriated such sums as may be necessary and appropriate to carry out the provisions

and purposes of this Act [sections 1921-1938 of this Appendix].

(b) Until such time as appropriations herein authorized are made, any department, agency, officer, Government corporation, or instrumentality of the United States may, in order to carry out its functions, powers, and duties under this Act [sections 1921-1938 of this Appendix], continue to incur obligations and make expenditures in accordance with laws in effect March 31, 1948. Mar. 31, 1948, c. 166, § 19, 62 Stat. 109.

§ 1938. Effective and Termination Date

This Act [sections 1921-1938 of this Appendix] shall become effective on April 1, 1948, and shall remain in effect until June 30, 1952. Mar. 31, 1948, c. 166, § 20, 62 Stat. 109; June 24, 1950, c. 357, § 1(b), 64 Stat. 256.

DISPOSAL OF GOVERNMENT-OWNED RUBBER-PRODUCING FACILITIES [NEW]

ACT AUG. 7, 1953, C. 338, 67 STAT. 408

§ 1941. Congressional Declaration of Policy

It is declared that disposal of the Government-owned rubber-producing facilities pursuant to the provisions of this Act [sections 1941-1941v of this Appendix] is consistent with the national security and will further effectuate the policy set forth in section 2 of the Rubber Act of 1948, as amended (62 Stat. 101 [section 1921 of this Appendix]) with respect to the development within the United States of a free, competitive, synthetic rubber industry. Aug. 7, 1953, c. 338, § 2, 67 Stat. 408.

§ 1941a. Rubber Producing Facilities Disposal Commission
(a) Repealed. Pub. L. 89-554, § 8(a), Sept. 6, 1966, 80 Stat. 657

Duties; Sales Contracts, Instruments of Conveyance, Leases and Additional Powers

(b) With respect to the Government-owned rubber-producing facilities it shall be the duty of the Commission, and it is authorized in accordance with the provisions of this Act [sections 1941-1941v of this Appendix] (1) to invite and receive proposals for the purchase of the facilities; to negotiate for their sale and make recommendations therefore to the Congress; to enter into appropriate contracts for their sale, which contracts shall be binding upon the Government and the prospective purchasers upon their execution subject only to the further provisions of this Act [said sections]; and in the performance of such contracts to execute and deliver such deeds or other instruments appropriate to effectively transfer to the purchaser thereof title to the facilities, no matter by what officer, agent, department, Government corporation, or instrumentality of the United States the same is held; (2) to lease and thereunder deliver possession of the alcohol butadiene facilities, if practicable; and (3) to take such action and exercise such powers as may be necessary or appropriate to effectuate the purposes of this Act [said sections].

Consultation with Attorney General

(c) From the time of its appointment and throughout the course of the performance of its duties, the Commission shall consult and advise with the Attorney General in order (1) to secure guidance as to the type of disposal program which would best foster the development of a free competitive synthetic rubber industry, and (2) to supply the Attorney General with such information as he may deem requisite to enable him to provide

the advice contemplated by this section and sections 9(a) (4) and 9(f) of this Act [section 1941g (a) (4), (f) of this Appendix].

Submission of Disposal Report to Attorney General

(d) Before submission of its proposed disposal report to the Congress, as provided for in section 9 of this Act [section 1941g of this Appendix], the Commission shall submit it to the Attorney General, who shall within a reasonable time, in no event to exceed ninety days, after receiving such report, advise the Commission whether, in his opinion, the proposed disposition will violate the antitrust laws.

Antitrust Laws as Unaffected

(e) Nothing in this Act [sections 1941-1941v of this Appendix] shall impair, amend, or modify the antitrust laws or limit and prevent their application to persons who acquire property under the provisions of this Act [said sections]. As used in this section, the term "antitrust laws" includes the Act of July 2, 1890 (ch. 647, 26 Stat. 209), as amended [sections 1-7 of Title 15]; the Act of October 15, 1914 (ch. 323, 38 Stat. 730), as amended [sections 12-27 of Title 15]; the Federal Trade Commission Act [section 41 et seq. of Title 15]; and the Act of August 27, 1894 (ch. 349, secs. 73, 74, 28 Stat. 570), as amended [sections 8 and 9 of Title 15]. Aug. 7, 1953, c. 338, § 3, 67 Stat. 408, amended Sept. 6, 1966, Pub. L. 89-554, § 8(a), 80 Stat. 657.

§ 1941b. Furnishing of Information Concerning Facilities to Commission on Request

The Commission shall be furnished upon its request all available information concerning the Government-owned rubber-producing facilities in the possession of any department, agency, officer, Government corporation, or instrumentality of the United

:s concerned with Government-owned rubber-producing ities. Aug. 7, 1953, c. 338, § 4, 67 Stat. 409.

41c. Prompt Disposal of Facilities by Commission; Hearings

he Commission shall proceed as promptly as practicable, lucting such hearings as may be necessary, with the disposal ie rubber-producing facilities in compliance with the provi- s of this Act [sections 1941-1941v of this Appendix]. . 7, 1953, c. 338, § 5, 67 Stat. 409.

41d. Restriction on Activities of Members and Employees After Leaving Commission; Penalty

a) Repealed. Pub. L. 89-554, § 8(a), Sept. 6, 1966, 80 657.

b) No member of the Commission and no person employed he Commission as an attorney, agent, or employee in activi- involving discretion with respect to negotiations or contracts ale of the Government-owned rubber-producing facilities, l, during the period of such employment, or for a period of years thereafter, be employed in any capacity by any pur- er, or affiliate thereof. No purchaser or affiliate thereof l employ in any capacity any person, who has served as a ıber of the Commission or who was employed by the Com- ion and served the Commission as an attorney, agent, or loyee in activities involving discretion with respect to nego- ons or contracts of sale of the Government-owned rubber- lucing facilities, while any such person is serving as a mem- or employee of the Commission or for a period of two s thereafter. Any person violating the provisions of this ection shall be fined not more than $10,000 or imprisoned more than one year, or both. Aug. 7, 1953, c. 338, § 6, Stat. 409, amended Sept. 6, 1966, Pub. L. 89-554, § 8(a), Stat. 657.

§ 1941e. Disposal Procedure—Invitation of Purchase Proposals; Notice and Advertisement; Period for Receipt of Proposals; Data to Accompany Proposals

(a) The Commission shall invite, upon adequate notice and advertisement, proposals for the purchase of the Government-owned rubber-producing facilities, hereafter referred to as the "facilities". The period for the receipt of porposals shall be determined and publicly announced by the Commission, and in no event shall be less than six months after the first day on which proposals may be received pursuant to the advertisement. The advertisement shall be in such form, contain such specifications and reservations, and be published in such manner as the Commission in its discretion determines will best effectuate the purposes of this Act [sections 1941-1941v of this Appendix]. All data concerning such facilities which in the judgment of the Commission may be reasonably required for the submission of a bona fide proposal shall be furnished by the Commission upon request by any prospective purchaser unless the Commission has reason to believe that such prospective purchaser has not identified his principal, or is not financially responsible, or is a poor security risk.

Form and Contents of Proposals

(b) Proposals shall be in writing, and shall contain, among other things—

(1) identification of the person in whose behalf the proposal is submitted, including the business affiliation of such person;

(2) the facility or facilities which are proposed to be purchased, and the order of preference if more than one facility is proposed to be purchased; or the order of preference if proposals are submitted on more than one facility, if only one facility is proposed to be purchased;

(3) the arrangements or plans, if any, formal or informal, for the supply of feedstock to, and the disposition

of the end products of, the respective facilities proposed to be purchased;

(4) the amount proposed to be paid for each of the facilities, and, if such amount is not to be paid in cash, then the principal terms of the financing arrangement proposed;

(5) the general terms and conditions which the prospective purchaser of a copolymer facility would be willing to accept in order to make the end product of such facility available for sale to small business enterprises, and the general terms and conditions which the prospective purchaser of a butadiene or styrene facility would be willing to accept in order to make the end product of such facility available for sale to purchasers of copolymer facilities; and

(6) such other information as the Commission in its notice and advertisement for proposals shall require be set forth in proposals including the prospective purchaser's acceptance of the terms, conditions, restrictions and reservations contained in subsection (b) of this section, and the interest rate to be charged on the purchase-money mortgage referred to in subsection (e) of this section.

Disclosure of Contents of Proposals

(c) Should it become necessary to the effective prosecution of the disposal program, the Commission may, after the termination of the period for the submission of proposals provided for in subsection (a) of this section, disclose the contents of the proposals at such time, in such manner, and to such extent as it deems appropriate.

Deposit of Cash or Government Bonds to Accompany Proposals

(d) Proposals shall be accompanied by a deposit of cash or United States Government bonds of face amount equal to 2½ per centum of the gross amount proposed to be paid but not exceeding $250,000 for each facility: *Provided, however,* That the deposit required in the case of a proposal for one of a

number of facilities on an alternative basis shall be the same as would be required if such proposal were for only the facility for which the particular prospective purchaser proposed to pay the highest amount. Except in the case of purchasers, deposits made hereunder shall be refunded without interest and not later than upon the termination of the period for congressional review as provided in section 9 of this Act [section 1941g of this Appendix]. In the case of purchasers, deposits made hereunder shall be applied without interest to the purchase price: *Provided, however,* That upon the closing of the contract of sale the purchaser shall be required to substitute cash equal to the face amount of the Government bonds then held in connection with such purchaser's proposal.

Payment of Purchase Price; Amount and Terms of Mortgages

(e) Payment of the purchase price may be made in part by a first lien purchase-money mortgage, in an amount not to exceed 75 per centum of the purchase price. The terms of any such mortgage obligation, to be determined by negotiation, shall provide among other things for a maturity of not more than ten years, periodic amortization, and a uniform interest rate of not less than 3 per centum per annum.

Negotiation with Those Submitting Proposals

(f) Promptly after the termination of the period for the receipt of proposals, pursuant to subsection (a) of this section, and for such period thereafter not less than seven months as may be determined and publicly announced by the Commission it shall negotiate with those submitting proposals for the purpose of entering into definitive contracts of sale.

Securing of Additional Information from Those Submitting Proposals

(g) Nothing contained in this Act [sections 1941-1941v of this Appendix] shall be construed to prevent the Commission from securing such additional information from those submit-

ting proposals at any time as the Commission may deem necessary or appropriate to fulfill its responsibilities under this Act [said sections].

National Security Clause in Contracts of Sale

(h) All contracts of sale and instruments in execution thereof shall contain a national security clause having terms, conditions, restrictions and reservations which will assure the prompt availability of the rubber-producing facilities, or facilities of equivalent capacity, for the production of synthetic rubber and the component materials thereof for a period of ten years from the date of the contract.

Effective Date of Contracts of Sale; Time for Transfer of Possession of Facilities; Failure to Complete Transfer Prior to Termination Date

(i) Subject to the conditions prescribed in section 24 of this Act [section 1941v of this Appendix], any contract of sale shall become fully effective upon the expiration of the period for congressional review provided for in section 9 of this Act [section 1941g of this Appendix] unless the Congress within such period has disapproved such sale. The transfer of possession of all of the rubber-producing facilities to be sold shall be made as promptly as is practicable after the effective date, in accordance with the terms of the contracts, but in any event within a period terminating sixty days after the expiration of the period for congressional review as provided in section 9(b) of this Act [section 1941g(b) of this Appendix]. The failure to complete transfer of possession prior to said termination date shall not give rise to or be the basis of rescission of the contract of sale.

Limitation on Government Rubber Sales

(j) Upon termination of the transfer period, as provided in subsection (i) of this section, the operating agency last designated by the President shall make no further sales of synthetic

rubber and its component materials except as otherwise provided in this Act [sections 1941-1941v of this Appendix].

(k) During the period of one year following the termination of the transfer period, the operating agency last designated by the President shall offer for sale to the purchasers of the facilities the synthetic rubber and its component materials held by it at a price determined in accordance with its pricing policy prevailing at the close of the transfer period, in amounts prorated in accordance with the ratio of the capacity of each such facility purchased to the total capacity of all facilities of the same type sold. Any synthetic rubber or component materials not purchased by an eligible purchaser during periodic intervals, as determined by the operating agency, shall be made available to other eligible purchasers on a like equitable basis. Any synthetic rubber or component materials not sold during such one-year period shall thereafter be disposed of in such manner as said agency deems advisable. Aug. 7, 1953, c. 338, § 7, 67 Stat. 409.

§ 1941f. Disposition of Unsold Facilities; Transfer to General Services Administration; Lease of Alcohol-Butadiene Facilities; Advice of Attorney General; Standby Funds

(a) Upon the termination of the transfer period, the operating agency last designated by the President, shall, as promptly as possible consistent with sound operating procedures, take out of production and place in adequate standby condition the rubber-producing facilities which shall not have been sold. At any time after the termination of production, such facilities may be transferred without reimbursement or transfer of funds to the General Services Administration and administered in accordance with the provisions of sections 6, 7, and 8 of the

National Industrial Reserve Act of 1948, as amended (62 Stat. 1227) [sections 456-458 of Title 50], or to such other agency as the President may designate for administration in such manner as he may direct. In such event (1) no such facility shall thereafter be operated as a rubber-producing facility for the account of, or by, the Government except pursuant to further Act of Congress; (2) no such facility, other than alcohol-butadiene facilities, shall be leased for operation as a rubber-producing facility at any time: *Provided*, That nothing contained in this Act [sections 1941-1941v of this Appendix] shall preclude the leasing of alcohol-butadiene facilities for purposes other than the manufacture of alcohol butadiene so long as such leases are in accordance with the provisions of section 8(a) or section 9(f) of this Act [subsection (a) of this section or section 1941g(f) of this Appendix]; and (3) no such facility shall be disposed of by sale within a period of three years from the termination of the transfer period, and in any subsequent lease or sale, the Government agency acting under authority of this section shall within a reasonable time and in no event less than sixty days prior to the lease or sale, request the advice of the Attorney General as to whether the proposed lease or sale would tend to create or maintain a situation inconsistent with the antitrust laws. The Attorney General shall give his advice within forty-five days of the receipt of such request. Upon the request of the Attorney General, the Government agency shall furnish, or cause to be furnished, such information as it may possess which the Attorney General determines to be appropriate or necessary to enable him to give the advice called for by this section.

(b) Whenever any transfer to any Government agency is made pursuant to this section, all unexpended funds budgeted as provided in section 9(e) [section 1941g(e) of this Appendix] for standby and maintenance in such condition shall also be transferred. Aug. 7, 1953, c. 338, § 8, 67 Stat. 411.

§ 1941g. Report of Recommended Disposal by Commission to Congress—Contents and Requirements

(a) Not later than thirty d[illegible]s after the termination of the negotiating period provided in section 7 of this Act [section 1941e of this Appendix], and in no event later than January 31, 1955, the Commissions shall prepare and submit to the Congress a report setting forth—

(1) the steps taken to elicit proposals and the proposals which have been received;

(2) the principal terms of all sales contracted for and the Commission's recommendations in respect thereto;

(3) in the event that there may have been a financially more advantageous proposal for any rubber-producing facility than the sale recommended, a statement of the reasons why such sale is nevertheless proposed;

(4) the statement from the Attorney General setting forth findings approving the proposed disposals in accordance with the standards set forth in section 3(c) of this Act [section 1941a(c) of this Appendix];

(5) the program to be followed to place in standby condition the rubber-producing facilities not sold;

(6) an inventory report concerning the Government's current stocks of synthetic rubber and its component materials;

(7) a program for the continuance, to the extent it deems necessary, during the fiscal year following the fiscal year in which the transfer period terminates, of the research program on synthetic rubber and its component materials then being carried on by the operating agency; and

(8) the names of persons who have represented the Government or the purchasers in conducting negotiations or in making contracts for disposal of the rubber-producing facilities.

Time of Submission of Report; Period for Action by Congress

(b) The report shall be submitted to both Houses of Congress on the same day. Upon the expiration of sixty days of continuous session of the Congress following the date upon which the report is submitted to it, the Commission shall proceed to carry out the contracts and proposals, as outlined in its report, to the extent that such contracts and proposals are not disapproved by either House of Congress by a resolution within the sixty-day period.

Computation of Period for Congressional Action

(c) For the purposes of subsection (b) of this section—

(1) continuity of session shall be considered as broken only by an adjournment of the Congress sine die; but

(2) in the computation of the sixty-day period there shall be excluded the days on which either House is not in session because of an adjournment of more than three days to a day certain.

Restriction on Sale or Lease of Rubber-Producing Facilities

(d) No rubber-producing facility shall be sold or leased except in accordance with this Act [sections 1941-1941v of this Appendix], or in accordance with section 7(d)(4) of the Rubber Act of 1948, as amended [section 1926(d)(4) of this Appendix].

Funds for Expenses; Annual Budget

(e) Such sums as may be required for the foregoing purposes may be provided out of the proceeds of disposal, and annual budgets for the expenses necessary for such purposes shall be submitted in accordance with the Government Corporation Control Act of 1945, as amended (59 Stat. 597) [section 841 of Title 31].

Leases of Alcohol-Butadiene Facilities; Requirements; Advice of Attorney General

(f) Notwithstanding any other provisions of this Act [sections 1941-1941v of this Appendix], the Commission may, after securing the advice of the Attorney General as to whether the proposed lease would tend to create or maintain a situation inconsistent with the antitrust laws, enter into leases for the alcohol-butadiene facilities for a period of not less than one year, nor more than three years: *Provided,* That any such lease shall contain among other things (1) a national security clause, and (2) provisions for the recapture of such facilities by the Government and the termination of the lease, if the President determines that the national interest so requires. Not less than sixty days prior to said lease the Commission shall request such advice from the Attorney General who shall give the same within forty-five days of the receipt of such request. Aug. 7, 1953, c. 338, § 9, 67 Stat. 412.

§ 1941h. President's Report to Congress on Nation's Rubber Requirements and Resources

At the expiration of one year after the transfer period or as soon thereafter as the Congress is in session, the President shall report to the Congress concerning the Nation's rubber requirements and resources, and the need, if any, for further research by the Government relative to the production or use of synthetic rubber and its component materials. Aug. 7, 1953, c. 338, § 10, 67 Stat. 413.

§ 1941i. Exclusion from Term "Rubber-Producing Facilities"

The term "rubber-producing facilities" as used in this Act [sections 1941-1941v of this Appendix] shall not include the Government-owned evaluation laboratory at Akron, Ohio. Aug. 7, 1953, c. 338, § 11, 67 Stat. 413.

§ 1941j. Disposition of Proceeds from Disposal of Facilities

All final net proceeds from disposal of the rubber-producing facilities shall be covered into the Treasury as miscellaneous receipts except as otherwise provided by this Act [sections 1941-1941v of this Appendix]. Aug. 7, 1953, c. 338, § 12, 67 Stat. 413.

§ 1941k. Prior Disposal of Facilities as Unaffected

The sales, leases, or other dispositions made prior to the enactment of this Act [sections 1941-1941v of this Appendix], pursuant to section 9(b) of the Rubber Act of 1948, as amended [section 1928(b) of this Appendix], shall not be affected by this Act [sections 1941-1941v of this Appendix]. Aug. 7, 1953, c. 338, § 13, 67 Stat. 413.

§ 1941l. Conditional Termination Dates for Rubber Act of 1948

Notwithstanding the provisions of section 20 of the Rubber Act of 1948, as amended [section 1938 of this Appendix], (1) if no report is submitted by the Commission, or if the report submitted by the Commission pursuant to section 9 of this Act [section 1941g of this Appendix] is disapproved in its entirety, then the Rubber Act of 1948, as amended [sections 1921-1938 of this Appendix], shall be extended until March 31, 1956; and (2) if the Commission submits a report and it is not disapproved in its entirety, the Rubber Act of 1948, as amended [sections 1921-1938 of this Apendix], shall terminate at the termination of the transfer period as provided in section 7(i) of this Act [section 1941e(i) of this Appendix]. Aug. 7, 1953, c. 338, § 14, 67 Stat. 413.

§ 1941m. Monthly Reports by Commission to Congress of Expenditures and Obligations

Thirty days following the receipt of proposals, as provided in section 7 of this Act [section 1941e of this Appendix], the Commission shall submit to the Congress a report stating the amount of funds expended by or obligated by the operating agency for the repair, replacement, additions, improvements, or maintenance of each synthetic rubber-producing facility for which proposals have been submitted. Thereafter reports shall be made monthly until such time as the Congress shall have permitted or disapproved in whole or in part the disposal recommended by the Commission. Aug. 7, 1953, c. 338, § 15, 67 Stat. 413.

§ 1941n. Basis for Negotiating Sale of a Facility

In arriving at its recommendations for the disposal of the facilities, the Commission shall use, as the basis for negotiating the sale of each facility the highest amount proposed to be paid for each facility, if, in the opinion of the Commission, the highest amount proposed to be paid was a bona fide proposal and was submitted by a person competent to operate a rubber-producing facility: *Provided*, That the words "competent to operate a rubber-producing facility" shall not be interpreted so as to require prior experience in the operation of a rubber-producing facility: *Provided further*, That in using such highest proposed amount as a basis for negotiations the Commission may negotiate with respect to any facility with any person who submitted a proposal on that or any similar facility and may recommend sale of any facility to any person who submitted a proposal on that or any similar facility at a price which is equal to, higher than, or lower than the highest amount proposed to be paid for each facility as the Commission determines will best effectuate the purposes of this Act [sections 1941-1941v of this Appendix]. Aug. 7, 1953, c. 338, § 16, 67 Stat. 413.

§ 1941o. Criteria for Disposal Recommendations

The following criteria, together with such other criteria as the Commission deems necessary or desirable to best effectuate the purposes of this Act [sections 1941-1941v of this Appendix], shall be used by the Commission in arriving at its recommendations for disposal:

(1) That the disposal program be designed best to afford small-business enterprises and users, other than the purchaser of a facility, the opportunity to obtain a fair share of the end products of the facilities sold and at fair prices;

(2) That the prospective purchaser has the technical competence necessary to operate a rubber-producing facility, except that prior experience in operating a rubber-producing facility shall not be required as a basis for determining whether a prospective purchaser has the technical competence necessary to operate a rubber-producing facility;

(3) That the recommended sales shall provide for the development within the United States of a free, competitive, synthetic rubber industry, and do not permit any person to possess unreasonable control over the manufacture of synthetic rubber or its component materials;

(4) That the prospective purchaser is acting in good faith, and actually intends to operate the facility or facilities for the purpose of manufacturing synthetic rubber or its component materials;

(5) That full fair value for the facility or facilities will be received by the Government, taking into consideration the policy set forth in section 2 of this Act [section 1941 of this Appendix];

(6) That disposal of the facility or facilities to the purchasers is consistent with national security; and

(7) That the facilities recommended for sale will in the aggregate be capable of annually producing not less than five hundred thousand long tons of general-purpose synthetic rubber, and not less than forty-three thousand long tons annually of butyl rubber.

Aug. 7, 1953, c. 368, § 19, 67 Stat. 414.

§ 1941p. Authorization of Disposal of Facilities Notwithstanding Rubber Act of 1948

Unless otherwise provided in this Act [sections 1941-1941v of this Appendix], the disposal of the Government-owned rubber-producing facilities shall be authorized notwithstanding the provisions of the Rubber Act of 1948, as amended [sections 1921-1938 of this Appendix]. Aug. 7, 1953, c. 338, § 18, 67 Stat. 414.

§ 1941q. Payment of Costs of Disposal from Operating Income

Unless otherwise provided in this Act [sections 1941-1941v of this Appendix], all costs incurred by the Commission or any other department, agency, officer, Government corporation, or instrumentality of the United States pursuant to the provisions of this Act [said sections] shall, so long as synthetic rubber is produced for the account of the Government in the Government-owned rubber-producing facilities, be paid from and charged against the operating income of the Government-owned synthetic rubber program, administered by the operating agency. Aug. 7, 1953, c. 368, § 19, 67 Stat. 414.

§ 1941r. Termination of Commission; Administration After Termination

The Commission shall cease to exist thirty days after the termination of the transfer period as provided by section 7(i) of this Act [section 1941e(i) of this Appendix), but nothing contained in this section shall be construed in any way so as to abrogate, modify, or adversely affect any contract of sale or lease of the Government-owned rubber-producing facilities pursuant to this Act [sections 1941-1941v of this Appendix]. After the Commission ceases to exist, such contracts and leases and other matters involving the Commission shall be administered by such agency of the Government as the President may designate. Aug. 7, 1953, c. 338, § 20, 67 Stat. 414.

§ 1941s. Definitions

(a) The term "synthetic rubber" means any product of chemical synthesis similar in general properties and applications to natural rubber, and specifically capable of vulcanization, produced in the United States, not including reclaimed synthetic rubber.

(b) The term "general-purpose synthetic rubber" means a synthetic rubber of the butadiene-styrene type generally suitable for use in the manufacture of transportation items such as tires or camelback, as well as any other type of synthetic rubber equally or better suited for use in the manufacture of transportation items such as tires or camelback as determined from time to time by the President.

(c) The term "rubber-producing facilities" means facilities, in whole or in part, for the manufacture of synthetic rubber, and the component materials thereof, including, but not limited to, buildings and land in which or on which such facilities may be located and all machinery and utilities associated therewith.

(d) The term "component materials" means the material, raw, semi-finished, and finished, necessary for the manufacture of synthetic rubber.

(e) The term "standby condition" means the condition in which rubber-producing facilities, in whole or in part, are placed if not sold or leased in accordance with this Act [sections 1941-1941v of this Appendix], but are maintained so as to be readily available for the production of synthetic rubber or component materials.

(f) The term "person" means any individual, firm, copartnership, business trust, corporation, or any organized group of persons whether incorporated or not.

(g) The term "operating agency" means the Department, agency, officer, Government corporation, or instrumentality of the United States designated from time to time by the President

pursuant to section 7(a) of the Rubber Act of 1948, as amended [section 1926(a) of this Appendix].

(h) The term "small business enterprise" means an enterprise independently owned and operated which is not dominant in its field of operation, due regard being given to the number of its employees and dollar volume of business. Aug. 7, 1953, c. 338, § 21, 67 Stat. 415.

§ 1941t. Termination Date of Rubber Act of 1948

Section 20 of the Rubber Act of 1948, as amended [section 1938 of this Appendix], is further amended as follows: In lieu of the date "March 31, 1954" insert the date "May 1, 1955". Aug. 7, 1953, c. 338, § 22, 67 Stat. 415.

§ 1941u. Congressional Resolutions Respecting Facilities—Resolutions as Rules of Congress; Changes

(a) The provisions of this section are enacted by the Congress:

(1) As an exercise of the rule-making power of the Senate and the House of Representatives, respectively, and as such they shall be considered as part of the rules of each House, respectively, but applicable only with respect to the procedure to be followed in such House in the case of resolutions (as defined in subsection (b)); and such rules shall supersede other rules only to the extent that they are inconsistent therewith; and

(2) With full recognition of the constitutional right of either House to change such rules (so far as relating to the procedure in such House) at any time, in the same manner and to the same extent as in the case of any other rule of such House.

Form of Resolution

(b) As used in this section, the term "resolution" means only a resolution of either of the two Houses of Congress, the matter after the resolving clause of which is as follows: (1) "That the

..... does not favor sale of the facilities as recommended in the report of the Rubber Producing Facilities Disposal Commission.", the blank therein being filled with the name of the resolving House; or (2) "That the ..... does not favor the sale of the ..... as recommended in the report of the Rubber Producing Facilities Disposal Commission.", the first blank therein being filled with the name of the resolving House and the other blank being filled with a description of the facility or facilities proposed to be sold.

Reference to Committee

(c) A resolution with respect to a facility or facilities shall be referred to a committee (and all such resolutions shall be referred to the same committee) by the President of the Senate or the Speaker of the House of Representatives, as the case may be.

Report by Committee; Motion to Discharge

(d) (1) If the committee to which has been referred a resolution with respect to a facility or facilities has not reported it before the expiration of ten calendar days after its introduction, it shall then (but not before) be in order to move either to discharge the committee from further consideration of such resolution, or to discharge the committee from further consideration of any other resolution with respect to such facility or facilities which has been referred to the committee.

(2) Such motion may be made only by a person favoring the resolution, shall be highly privileged (except that it may not be made after the committee has reported a resolution with respect to the same facility or facilities), and debate thereon shall be limited to not to exceed one hour, to be equally divided between those favoring and those opposing the resolution. No amendment to such motion shall be in order, and it shall not be in order to move to reconsider the vote by which such motion is agreed to or disagreed to.

(3) If the motion to discharge is agreed to or disagreed to, such motion may not be renewed, nor may another motion to discharge the committee be made with respect to any other resolution with respect to the same facility or facilities.

Motion to Consider Resolution; Amendment

(e) (1) Where the committee has reported, or has been discharged from further consideration of, a resolution with respect to a facility or facilities, it shall at any time thereafter be in order (even though a previous motion to the same effect has been disagreed to) to move to proceed to the consideration of such resolution. Such motion shall be highly privileged and shall not be debatable. No amendment to such motion shall be in order and it shall not be in order to move to reconsider the vote by which such motion is agreed to or disagreed to.

(2) Debate on the resolution shall be limited to not to exceed ten hours, which shall be equally divided between those favoring and those opposing the resolution. A motion further to limit debate shall not be debatable. No amendment to, or motion to recommit, the resolution shall be in order, and it shall not be in order to move to reconsider the vote by which the resolution is agreed to or disagreed to.

Motions and Appeals from Decisions on Rules to Be Decided Without Debate

(f) (1) All motions to postpone, made with respect to the discharge from committee, or the consideration of, a resolution with respect to a facility or facilities, and all motions to proceed to the consideration of other business, shall be decided without debate.

(2) All appeals from the decisions of the Chair relating to the application of the rules of the Senate or the House of Representatives, as the case may be, to the procedure relating to a resolution with respect to a facility or facilities, shall be decided without debate. Aug. 7, 1953, c. 338, § 23, 67 Stat. 415.

§ 1941v. Rejection of Recommended Sales Contract; Right to Review of Purchaser of Other Facilities; Minimum Annual Production Necessary to Sustain Disposal Report

Notwithstanding any provisions of this Act [sections 1941-1941v of this Appendix], in the event that the recommended sale of any facility is disapproved by either House of the Congress, any prospective purchaser of any other facility shall have a period of thirty days after the termination of the period for review by the Congress in which to reject the recommended sales contract with regard to the facility or facilities which he has agreed to purchase: *Provided,* That if as a result of the disapproval by either House of the Congress of the sale of any facility or facilities, or as a result of the rejection of one or more sales contracts by any prospective purchaser as provided in this section, the remaining facilities to be sold will in the aggregate not be capable of annually producing at least 500,000 long tons of general purpose synthetic rubber and at least 43,000 long tons of butyl rubber, then no facility shall be sold under this Act [said sections], and for the purposes of this Act [said sections] the report of the Commission shall be deemed to have been disapproved in its entirety. Aug. 7, 1953, c. 338, § 24, 67 Stat. 416.

§ 1941w. Disposal of Rubber-Producing Facility at Baytown, Texas—Receipt of Proposal

(a) Notwithstanding the second sentence of section 7(a) [section 1941e(a) of this Appendix], the period for receipt of proposals for the purchase of the Government-owned rubber-producing facility at Baytown, Texas, known as Plancor Numbered 877, shall not expire until the end of the thirty-day period which begins on the date of the enactment of this section [March 31, 1955].

Negotiation Period

(b) If one or more proposals are received for the purchase of Plancor Numbered 877 within the time period specified in subsection (a), the Commission, notwithstanding the expiration of the period for negotiation specified in section 7(f) [section 1941e(f) of this Appendix], shall negotiate with those submitting the proposals for a period of not to exceed sixty days for the purpose of entering into a definite contract of sale.

Report to Congress; Transfer Period

(c) Within ten days after the termination of the actual negotiation period referred to in subsection (b), the Commission shall prepare and submit to the Congress a report containing, with respect to the disposal under this section of Plancor Numbered 877, the information described in paragraphs (1) to (5), inclusive, and paragraph (8) of section 9(a) [section 1941g(a) of this Appendix]. Unless the contract is disapproved by either House of the Congress by a resolution prior to the expiration of thirty days of continuous session (as defined in section 9(c) [section 1941g(c) of this Appendix]) of the Congress following the date upon which the report is submitted to it, upon the expiration of such thirty-day period the contract shall become fully effective and the Commission shall proceed to carry it out, and transfer of possession of the facility sold shall be made as soon as practicable but in any event within thirty days after the expiration of such thirty-day period. The failure to complete transfer of possession within thirty days after the expiration of the period for congressional review shall not give rise to or be the basis of rescission of the contract of sale.

Standby Condition

(d) If, upon termination of the transfer period provided for in subsection (c), no contract for the sale of Plancor Numbered 877 has become effective, the operating agency last designated

by the President shall, as promptly as possible consistent with sound operating procedures, take said Plancor out of production and place it in adequate standby condition under the provisions of section 8 of the Rubber Producing Facilities Disposal Act of 1953 [section 1941f of this Appendix]: *Provided*, That the provisions in said section relating to the time for placing facilities in standby conditon shall not apply to Plancor Numbered 877. Aug. 7, 1953, c. 338, § 25, as added Mar. 31, 1955, c. 19, § 1, 69 Stat. 15.

§ 1941x. Disposal of Rubber-Producing Facility at Institute, West Virginia—Receipt of Proposal

(a) Notwithstanding the second sentence of section 7(a) [section 1941e (a) of this Appendix], the period for receipt of proposals for the purchase of the Government-owned rubber-producing facility at Institute, West Virginia, known as Plancor Numbered 980, shall not expire until the end of the sixty-day period which begins on the date of the enactment of this section [August 9, 1955].

Negotiation Period

(b) If one or more proposals are received for the purchase of Plancor Numbered 980 within the time period specified in subsection (a), the Commission, notwithstanding the expiration of the period for negotiation specified in section 7(f) [section 1941e (f) of this Appendix], shall negotiate with those submitting the proposals for a period of not to exceed seventy-five days for the purpose of entering into a definite contract of sale.

Report to Congress; Transfer Period

(c) Within ten days after the termination of the actual negotiation period referred to in subsection (b), or, if Congress is not then in session, within ten days after Congress next convenes, the Commission shall prepare and submit to the Congress a report containing, with respect to the disposal under this sec-

tion of Plancor Numbered 980, the information described in paragraphs (1) to (5), inclusive, and paragraph (8) of section 9(a) [section 1941g(a) of this Appendix]. Unless the contract is disapproved by either House of the Congress by a resolution prior to the expiration of thirty days of continuous session (as defined in section 9(c) [section 1941g(c) of this Appendix]) of the Congress following the date upon which the report is submitted to it, upon the expiration of such thirty-day period the contract shall become fully effective and the Commission shall proceed to carry it out, and transfer of possession of the facility sold shall be made as soon as practicable but in any event within thirty days after the expiration of such thirty-day period. The failure to complete transfer of possession within thirty days after the expiration of the period for congressional review shall not give rise to or be the basis of rescission of the contract of sale.

Standby Condition

(d) If, upon termination of the transfer period provided for in subsection (c), no contract for the sale of Plancor Numbered 980 has become effective, the operating agency last designated by the President shall continue to maintain said Plancor in adequate standby condition under the provisions of section 8 of the Rubber Producing Facilities Disposal Act of 1953 [section 1941f of this Appendix]. Aug. 7, 1953, c. 338, § 26, as added Aug. 9, 1955, c. 696, § 1, 69 Stat. 628.

§ 1941y. Disposal of Rubber-Producing Facility at Louisville, Kentucky—Receipt of Proposal

(a) Notwithstanding the second sentence of section 7(a) [section 1941e(a) of this Appendix], the period for receipt of proposals for the purchase of the Government-owned rubber-producing facility at Louisville, Kentucky, known as Plancor Numbered 1207 and hereinafter referred to as the "Louisville plant", shall not expire until the end of the thirty-day period

which begins on the date of the enactment of this section [March 21, 1956].

Negotiation Period

(b) If one or more proposals are received for the purchase of the Louisville plant within the time period specified in subsection (a), the Commission, notwithstanding the expiration of the period for negotiation specified in section 7(f) [section 1941e(f) of this Appendix], shall negotiate with those submitting the proposals for a period of not to exceed thirty days for the purpose of entering into a contract of sale.

Report to Congress; Transfer Period

(c) Within ten days after the termination of the actual negotiation period referred to in subsection (b), or, if Congress is not then in session, within ten days after Congress next convenes, the Commission shall prepare and submit to the Congress a report containing, with respect to the disposal under this section of the Louisville plant, the information described in paragraphs 1, 2, 3, 4, and 8 of section 9(a) [section 1941g(a) of this Appendix]. Unless the contract is disapproved by either House of the Congress by a resolution prior to the expiration of thirty days of continuous session (as defined in section 9(c) [section 1941g(c) of this Appendix]) of the Congress following the date upon which the report is submitted to it, upon the expiration of such thirty-day period the contract shall become fully effective and the Commission shall proceed to carry it out, and transfer of possession of the facility sold shall be made as soon as practicable but in any event within thirty days after the expiration or termination of the existing lease on the Louisville plant. The failure to complete transfer of possession within thirty days after expiration or termination of the existing lease shall not give rise to or be the basis of rescission of the contract of sale. Aug. 7, 1953, c. 338, § 27, as added Mar. 21, 1956, c. 89, § 1, 70 Stat. 51.

APPENDIX G

Transcript of Relevant Portions of the December 5, 1966, Argument Before the United States Court of Appeals for the Fourth Circuit.*

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* Mr. Irons being counsel for Firestone.

PORTIONS OF ARGUMENT BEFORE THE COURT OF APPEALS FOR THE FOURTH CIRCUIT IN GENERAL TIRE & RUBBER COMPANY vs. THE HONORABLE R. DORSEY WATKINS, APPEAL No. 10,993, DECEMBER 5, 1966 (No. 12,932)

* * * * *

Mr. Irons (For Firestone): If the Court please, I don't think that Mr. Merriam has said anything that he did not say in his brief and which I think I have answered in mine. So I am going to make my comments rather brief and to the point about some of the things he did say.

Judge Haynsworth: I don't think he said a thing that wasn't in his brief, either, but maybe you can say something that wasn't in your brief.

On this tape Mr. Birch said he was relaying a message from you?

Mr. Irons: Yes, sir.

Judge Haynsworth: And he didn't know what it meant?

Mr. Irons: Yes, sir.

Judge Haynsworth: Can you tell us what it meant?

Mr. Irons: Yes, sir. I will answer your question as best I can, and when I finish I would like to make a comment not by way of explanation of what I say. I want to advert to this tape and do the best I can to answer the question.

I am looking for the transcript of the tape in this appendix.

Judge Haynsworth: Page 35.

Mr. Irons: Thank you.

Judge Winter: Appendix 35 of the Petition.

Mr. Irons: I might say that in my brief the questions which were raised by Mr. Merriam are in effect answered on the record, but I want to answer this anyway.

Mr. Birch said, at page 36:

> "Now, here is what we'd like to do, if it's all right with you, with full recognition that the agreement that was made between you and Stanley Clark is not going to, in the long run, change one tiny little bit." And he went on to say, "After this is all over with, why, everything will come out in the wash."

The question which has been posed by Mr. Merriam is, what is the agreement that was made between you and Stanley Clark which was not going to change one little bit, and what is it that was going to come out in the wash? I will answer that question.

Judge Watkins' Opinion reflects there was an understanding reached about the date the suit was filed that

Firestone would carry the bulk of the expenses in this litigation. Plaintiffs' Exhibit 1836 shows that Mr. McCreary was advised that he would have to pay his way.

Now, as Mr. Clark also testified, which is at page 72 of the Intervenor's transcript, we did not have at that time any specific basis on which the payment of fees was going to be apportioned, and Mr. McCreary wasn't advised of any, and we didn't tell him of any or discuss it with him.

Judge Haynsworth: If there was no understanding, what was the agreement with Mr. Clark that was not going to change one tiny little bit?

Mr. Irons: That Firestone would carry the bulk of the expenses in the litigation.

Judge Haynsworth: It was not that they were going to pay them all?

Mr. Irons: No, your Honor, it was not.

Judge Haynsworth: Well, then, why the suggestion "The agreement is not going to change one tiny little bit"? And at the end "It will all come out in the wash"? "We are going to bill you for one per cent of the charges."

Mr. Irons: What I want to answer about that is in the context of what Mr. Birch said it is something I told him to say, and it is this: The proposition which was offered to Mr. McCreary at that time was that he would pay one per cent because one per cent was the relative production basis. All right?

Judge Haynsworth: That's consistent with the general understanding that Firestone would pay the bulk of the expense, 99 per cent.

Mr. Irons: All right.

Judge Haynsworth: But he says now this isn't going to change the agreement you have with Mr. Clark one tiny little bit. Your explanation is that it fixes an unspecific understanding.

Mr. Irons: My explanation is not finished yet, Your Honor.

Judge Haynsworth: All right, sir.

Mr. Irons: I want to come to the "It will all come out in the wash" part and why the telephone call was made. I am going to answer the second question first.

The phone call of May 9th was made to fix a basis for billing Mr. McCreary on a percentage basis.

Now, "Everything will come out in the wash." As I can best recall it, Judge Haynsworth, I had some preliminary concern about this because I knew there would be many, many months—Our firm bills on a monthly basis. The record shows McCreary was billed that way. There would be many, many months when we would not work at all for McCreary and we would still send McCreary a bill. There would be other months when one per cent wouldn't come close to perhaps the time we had spent working for McCreary that month, and it was in that context, as far as what I meant, at the time I communicated to Mr. Birch that everything would come out in the wash, that these bills would balance out over a time period as the suit went along. And we suggested that if we went on this one per cent basis and billed on a monthly basis one per cent, there would be—this is not on the tape. This is what you asked me for, my explanation.

Judge Haynsworth: Yes, sir.

Mr. Irons: That's what I meant. If I said it in words or substance to Mr. Birch, this is what I meant and what

motivated it, that there would be some months when we do no work for McCreary and bill them.

Judge Haynsworth: And in your practice I suspect with your clients, you have an understanding about fees like this, you write them a letter, don't you?

Mr. Irons: I don't think I have ever written a client about a fee arrangement. I am quite serious about that. There may be exceptions but I don't think of any.

Judge Haynsworth: Perhaps you don't. You have an understanding about it but you don't say, "I don't want to talk about it too much for obvious reasons or put anything in the mail."

Mr. Irons: I don't want to evade that one, either. Mr. Birch said that he did not recall that I said that. He said that he didn't want to talk about the firm's billing. That's his recollection. I don't recall that I said any such thing to him.

Judge Haynsworth: But isn't this a fact, that it is in the tape, "I don't want to put anything in the mail and I don't want to talk about it too much for obvious reasons"? Doesn't that strongly suggest that the understanding was pretensive?

Mr. Irons: I don't think it does at all. I don't agree with Your Honor on that point at all.

Judge Haynsworth: Well, I am asking you whether or not it doesn't suggest it because I want to hear what you have to say. I am not saying that I have any conclusion in my mind but these questions do arise in my mind when I read this tape.

Mr. Irons: Quite properly.

Now, I want to say flatly that, of course, the agreement was not pretensive, and I want to come back to that. This business about not wanting to put anything in the mail, as I said, I don't have any present recollection of why I said it or whether or not I said it to Mr. Birch, but if I said such a thing, my own judgment about it would have been that this was in the context of litigation and I didn't want to create any more documents than were necessary, not because there was anything to hide at all but just because this is a practice we normally follow in litigation situations, and we do not write a lot of papers which are unnecessary, and I don't know that I have said it or thought it at that time—I am talking about some effort to reconstruct—on December 5, 1966, why I may have said such a thing.

Judge Haynsworth: And yet, offhand, wouldn't it seem that if there had been a general understanding that Firestone would pay the bulk of the expense, that McCreary would pay a fair share, that you would specify the understanding so that you would know exactly what would be billed and this is what we will put it on?

Mr. Irons: I don't want to argue with you, Judge Haynsworth. It was not done. But McCreary did pay one per cent of the expense up until the time the lawsuit was settled.

Judge Haynsworth: This is what was agreed upon here.

Mr. Irons: That's right. And McCreary settled, Mr. Merriam told Judge Watkins, for $100,000, and we didn't pay the bill and we aren't holding McCreary harmless, and there is no secret agreement.

To the extent that there is an adverse inference to be drawn from the comment about putting something in the

mail, it is unfortunate because there is no fact or evidence—

Judge Haynsworth: Well, it starts out with about the first thing, "The reason I wanted to call you is that we want to avoid any inference that you are our little patsy, and the way to avoid it is to bill you for one per cent in the course of each month."

Mr. Irons: Yes, Your Honor, because the fact was that McCreary was (A) independent, was (B) paying its own way, was (C) not held harmless.

Judge Haynsworth: At this time it wasn't.

Mr. Irons: This time is May 9, 1961.

Judge Haynsworth: Yes, I know.

Mr. Irons: On March 30, 1961, Mr. McCreary in Defendant's Exhibit 1836 had been told two things: One, that he would have to pay his own way and two, that if he lost, we lost, and he wasn't going to be held harmless. At that point in time there had been no arrangement made as to how the fees were going to be divided. That remained to be done.

Frankly, our office overlooked, and it is probably I overlooked billing McCreary at the end of March. This was March 30th, our billing time for April came up early in May. It was necessary at that time to decide upon how McCreary was going to be billed. I am quite sure that's why that telephone call was made, and Mr. Clark himself said as to why the call was made, he supposed it was for that reason.

Now I want to come back to where I was about this "patsy" business. McCreary was not a patsy; McCreary

was independent. McCreary did not have a hold harmless, McCreary was paying its own way, and if we were ever asked, I wanted to be able to show that we had, in fact, implemented this, which was in fact the agreement pursuant to which McCreary was paying its own way. That's why I wanted to bill them. That's why we did bill them just like we bill anybody else.

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